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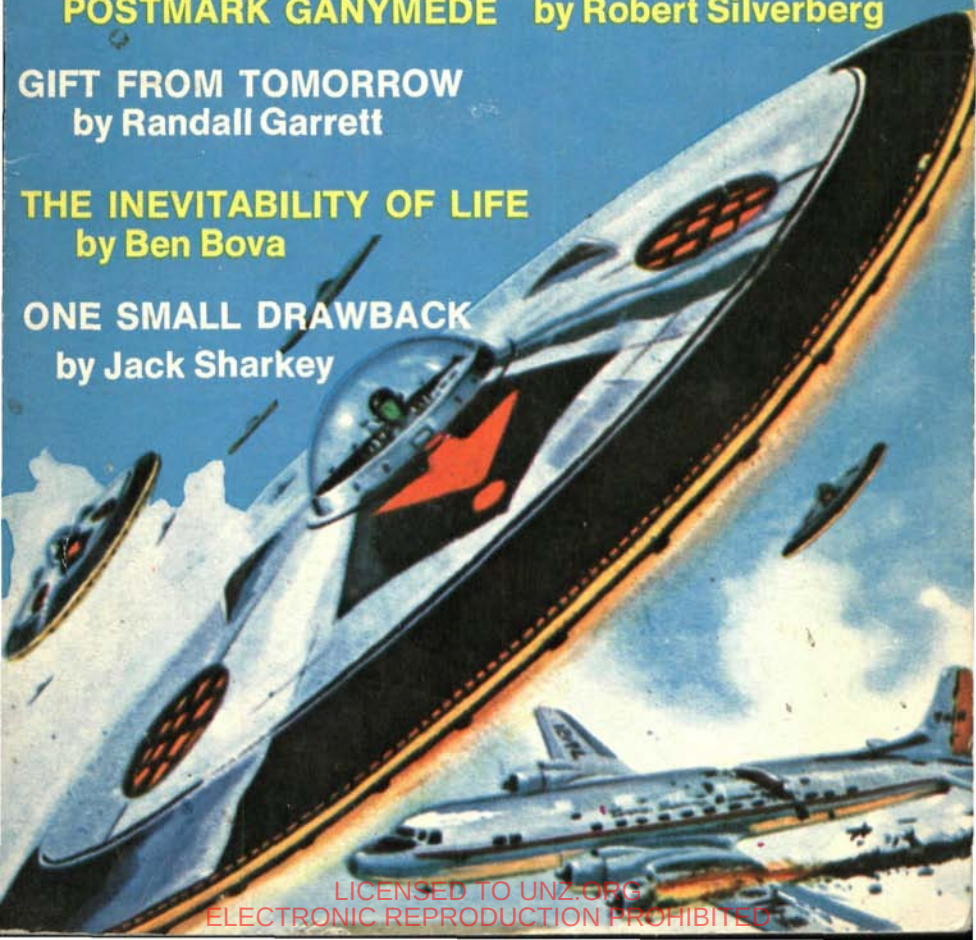

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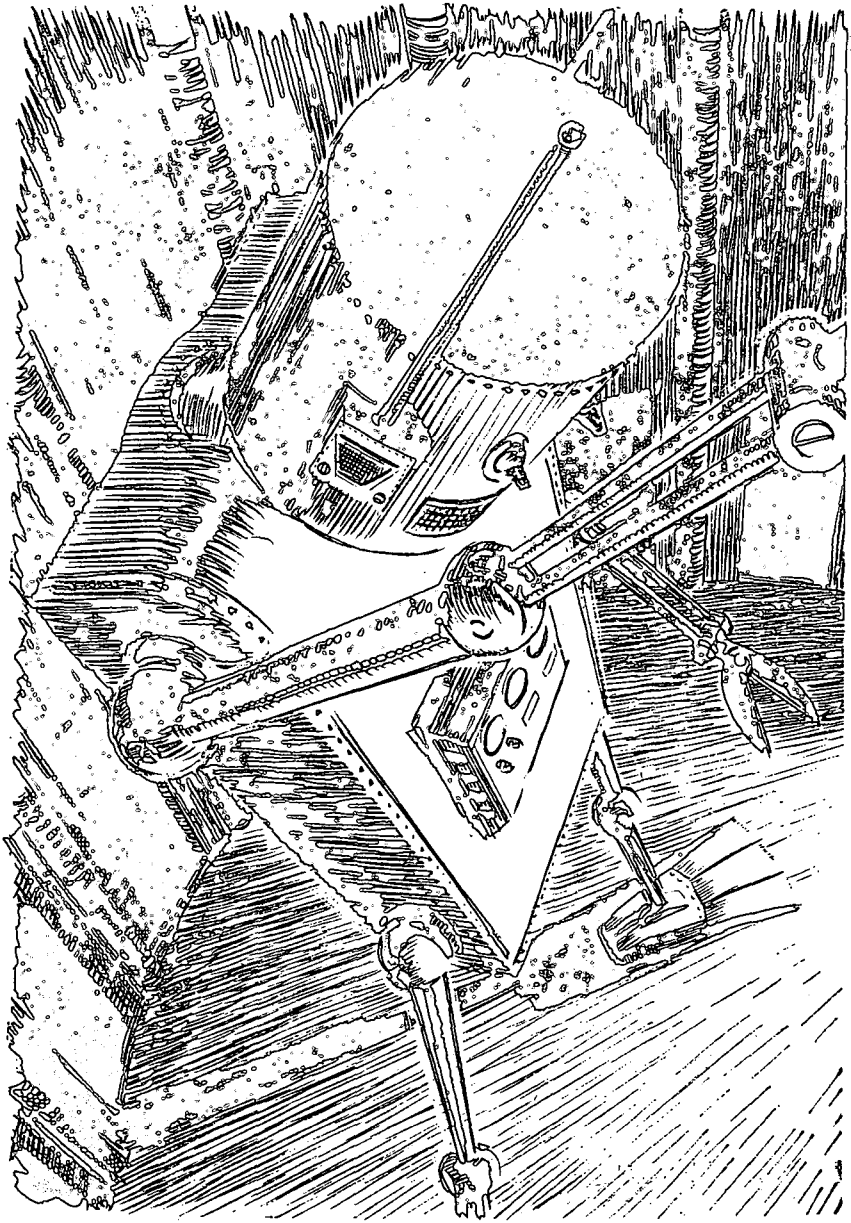

The vast robot lifted the screaming Vedria

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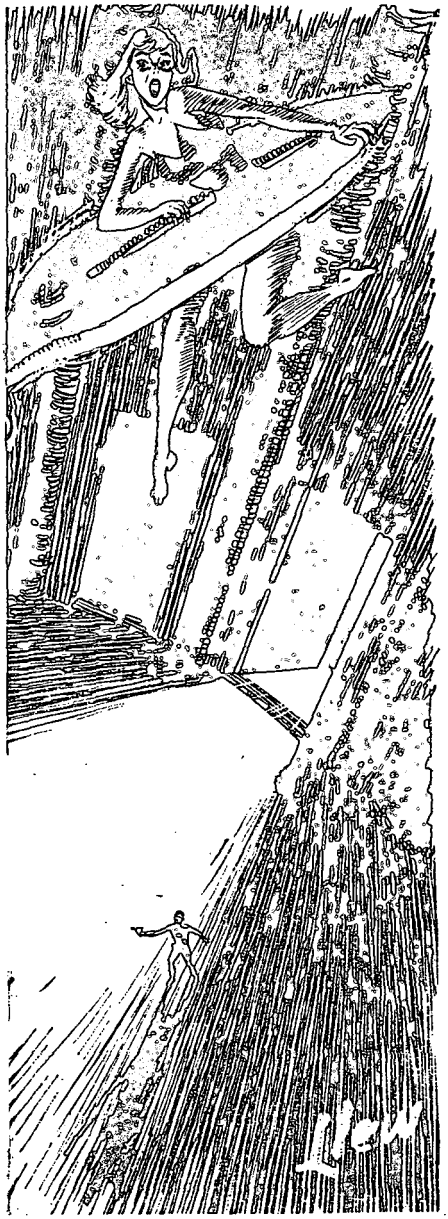

as I stood by helplessly.

It began with a beautiful girl being jet-dragged through space, a common practice on Sygor. There was also a tyrant — a mental giant who could think men into suicide, and a robot the like of which mortal man had never seen. All of which added up to a terrible climax—

THE VENGEANCE OF GALAXY 5

By HARLAN ELLISON

TWO things made me want to hang around the planet Sygor out in Galaxy 5.

The first was their refusal to give me landing coordinates.

They had thrown a force Barrier up around the planet. It kicked the *Pitchman* back half a mile, when I tried to crash-open it. Then that insulting voice from Sygor control-center split through my intercom. "Go away! There is no landing allowed! We want no strangers here!"

Strangers? *That* was good! I'd been coming to Sygor once every two and a half years for

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the past fifteen. It was the eighth planet on my trading route. I'd always been able to bring in luxury items—Caputian snake-rings, Armani snuff and spices, living puppets from JawkThor and five-coppers from Heos II—and carry away spools of glass-thread.

It had never been an especially profitable stopover—not as profitable, say, as the stopover on Blassingworth, where they swapped goblets carved from rubies and diamonds for jazz records by Bix and Brubeck, Satch and Django—but it was a pleasant sort of world, and it was a break in the light-year run from Caputia. And never let it be said that Loper Martin passed up a buck.

"What do you mean *stranger?*" I yelled into the com-box.

"No co-ordinates will be given you . . . the Barrier will not be opened. Go away or we will fire on you!"

That was the first reason I wanted to hang around Sygor. It had always been a friendly planet, and now suddenly it had become not only closed-off, but definitely hostile. There was something wrong down there.

And I don't like being pushed.

The second reason came speeding up from the planet ten minutes later, as I circled Sygor's blue and orange bulk. I wasn't going away that easily, and reconnaissance seemed like a good idea. It just happened I was there at that moment; it was straight chance — completely unpredictable. I was passing over the Desert of the Sun, all glowing with iridescent orange sand, when the sport-jet shot into the sky.

I watched it for a second, the little blue-steel body and swept-back wings, till I realized the pilot was towing something. Even then it didn't interest me a lot till I saw he was towing—a girl!

She was stripped down to pants and bra, and they'd spot-welded chains to her upper arms. She was being jet-dragged out to the edge of the Barrier, and in another minute I knew what would happen. It was the usual way —out this end of the galaxy— to get rid of someone you didn't like.

Jet-drag 'em till their breath was blocked off, they were half-conscious from the jetstream and the loss of oxygen, and then "crack-the-whip" with them! It was a vicious form of murder, and the end result was the victim

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speeding out like a rocket into dead space. If they didn't have a broken neck by then, they'd suffocate.

And the girl was too well-built to finish that way.

I tossed the *Pitchman* into primary drive and slipped down toward the Barrier. Fast.

The little jet was coming up in a blue streak, and I knew if he was going to crack-the-whip with her—they'd have to let down the Barrier to do it. This might be a double benefit.

If I could save the girl, and get inside the Barrier, I might be able to satisfy myself about what was boiling on Sygor.

But I'd have to be good in this. A sort of cosmic basketball game, with the doll as the ball! I banked over him, vectoring across the sport-jet's path. He hadn't seen me yet, and I knew he wasn't coming out into space, because there wasn't any cowl on the jet's cockpit.

I arced over him and whipped in front just as my potentiometer blinked red that the Barrier was down. At that instant the jet pilot threw the little ship into reverse, killing its speed instantly, and letting the chain between girl and ship whip her forward. He must have cut the connecting link on the jet as he stopped —because the girl slammed past and roared through into space.

I came at them then, with full drive, because a human being can exist in space something like seventy seconds and I didn't want to press the girl's luck. The jet grew big in my viewplate, and I saw the pilot's face as clearly as I cared to see it.

A paunchy, washed-out face with high arched eyebrows and ebony eyes. A slash mouth and an expression of hatred. His mouth opened as I sped toward the girl. He mouthed something as the girl and chain sped toward me.

And when I opened up the scoop, and the dame clanged inside, he screamed. It was all so clear in the viewplate . . . we were that close!

The scoop hole was padded —for snaking in damageable goods from freighters in space —so I knew she was all right. But I had to open the sphincter-valve between decks, so she could get up where the air was breathable.

I gave a mock, phony salute to the slob in the sport-jet and jiggled over his head, making for the planet below.

Another few minutes and

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he wasn't even a speck in the evening sky. He was gone.

The girl didn't get much farther than the storage hold. She collapsed, and that's where I found her. She was half-tumbled over a crate of some breakfast cereal I was hauling to Fond-Dag-Lac, and the chain was so heavy it had pulled the metal circlets tight. She was bleeding from both arms and unconscious.

She was a honey blonde, the kind most people call a "raving beauty." But there was more to her than the hair, which isn't the case with most honey blondes. Her features were regular and small, just right for her heart-shaped face. But there was a regalness, a *queenly* something about her, that would have marked her in a harem full of honey blondes.

Her body was slight, but full, and I found it amazing that she had stood up under the punishment of being jet-dragged. It showed stamina of a rare sort.

I was attracted . . . but *attracted!*

"You could probably observe me better if I were lying down somewhere," she said, and I realized she'd come to consciousness, caught me staring.

"Oh . . . er . . . *sorry,*" I bumbled, stooping to lift her.

She brushed my hand away, and stumbled to her feet unaided. This girl had a corner on the guts market. "Where's the lounge?" she asked.

"No lounge," I spread my hands in sorrow. "All I've got is a contourcouch if you want to lie down."

"How remarkable that you should think I'd want to lie down . . ." she started, and then fell into my arms, dead again.

I hoisted and carried her updecks, laid her out on the couch. She was tossing and mumbling in her coma, and I seemed to catch the words *Aslik,* and *Felara* and a whole sentence of jumbled phrases. She repeated them over and over; mostly the names.

The name Felara I recognized. It was the name of the Prince of Sygor. Felara was the fifteen-year-old son of King Lormell, who ruled the planet with his Electorate Congress. Why this girl should be mumbling his name was something I didn't understand. But I was going to find out.

I went into the workshop and brought back an electrosaw, to scorch off those arm bracelets. She wakened as I was needling a thin line

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through the second one. She watched me in silence, her brown eyes masked by wariness.

"He didn't seem to like you," I ventured.

She gave a grunting half-laugh, and rubbed her arms where the bracelets had bitten deeply. "He doesn't much like anybody," she answered. "He's hired not to like people." It wasn't much of a conversation, and she didn't look like she was going to make it any better—unless I prodded her.

I plunked into the control chair and swiveled around, staring at her openly. "Look, miss, I haven't the faintest idea who you are, or why that joker was trying to ruin your complexion—but something's going on down there, and it's wrecking my schedule, so I'd like to know what it is . . . if you know."

She continued to watch me, and then she began to laugh. It was a high, hysterical laugh, and in a minute I reached across to slap her, but she waved a hand at me, easing me off.

"Don't be gallant," she gasped as the laughter subsided. "I'm not hysterical. It's just funny to hear you mouthing those melodramatic lines while a whole galaxy is being knuckled-under."

I'm afraid I stared open-mouthed.

"Who are you?" I asked.

"I'm not sure I should tell you," she said, suddenly serious. "It's been a long time since I was able to trust even people I've known all my life. And you don't even come *close* in that category."

I let my hands flap in frustration. "Look, I don't know what you're afraid of, but I haven't been around for almost three years—now if you want to talk, talk. If you don't, I'll set you down someplace and I'll find out for myself."

I jerked a hand at the viewport, and saw the Skytooth Mountain chain falling below us. I wanted to set the *Pitchman* down fairly quickly, anyhow. That joker in the sport-jet would come looking for us—probably with friends.

An expression of doubt came across the girl's face, and she pursed her beautiful lips for a second. "I'm stuck. I've got to trust *somebody*. It may as well be you."

I leaned forward to catch her next words, but she motioned me to man the drive. "We've got to get out of sight. You say you've been here before?" I nodded, and she said,

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"Do you know where the Rainbow Forest is?" I nodded again, and she followed up with, "Then take this ship there, and I'll show you where to set down. We can camouflage it for a while, and I'll try to explain how Sygor was overrun."

My eyes must have opened wider, because a bitter little smile flicked on and off her lips. "Yes, that's right," she repeated very, very quietly, "I said overrun.

"Sygor has been in enemy hands for over two years."

I started to ask her a million questions—chief among which was: *what enemy?* But she shut me up with a sharp wave of her hand, that somehow backed me off, and I tooled the *Pitchman* away, following the directions she gave for staying beneath sono-tracking range, toward the Rainbow Forest.

It took something like half an hour to cross the main continent. We had to thread down through a canyon pass in the five-mile high pile of mountain, so I eased the ship into secondary, and crept down between the towering walls.

Just as we were trailing through the quarter mile-wide canyon that led to the Rainbow Forest, we were spotted by a pair of night-black swoop-fighters.

"Aslik's guard!" the girl moaned, as they swam onto the viewplate.

I didn't have time to ask her who Aslik was, or what their intentions were, but they demonstrated the latter immediately.

The leading ship dodged, ducked, did a half-roll and came down on us—trapped between the walls of the orange-rock canyon — blasting as he came.

The first threads of his beam washed across the roof of the cab, but he was still too far away for them to have real intensity; they merely blistered the plasteel a bit. I rolled and tried doubling back up, out of the box-in. But it was no use. The second ship, black as a *tezenee's* eyes, had the end of the canyon behind us blocked off, was coming in dead on-target, with us lined up in his robotsights.

I let the *Pitchman* slide off to the side, hoping to send the swoop-fighters into the canyon wall, but they were experienced men and they knew their business. I was too big to maneuver easily in there; my twenty-thread blasters were useless; they knew it!

The first ship had doubled back and was coming in

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eleven o'clock high, and ready for a full-run spray with those deadly ten-threads.

We were boxed in, with swoopers coming in, front and back, like a wild animal trapped in the brush; beaters all about, and no chance to maneuver.

I saw them getting bigger and bigger on the viewplate, and next to me I could hear the girl drawing in her breath raggedly. I tossed her a snap glance and she was sitting there tightly, her face screwed down into one of inexpressible pain, her beautiful face knitted weirdly, her eyes screwed shut, her fists clenched and the thumbs making idle circling movements. I could see every nerve of her straining, tensing—why?

The swoop-fighters leveled, and there was an exultant something about the way they wing-waggled as they bore down on us.

My life didn't flash in front of my eyes, but I knew I was dead . . .

Then they exploded.

They each coughed, bucketed, and shattered. Parts and flesh spewed out across the canyon, and the roar sent the *Pitchman* skewing almost into the walls. I dragged the controls to steady, and set them auto. Then I hyped up the magnification on the viewers, and watched the puffs of radioactive smoke—like dirty soap-suds—that floated in the cross-winds of the canyon. The swoopers had gone up like kindling—and there was only one thing that could do it:

They had—of their own accord—flooded their drive chambers. They had, in effect, dumped their drive-rods into the critical pile stuff, and blown themselves up.

Which was impossible! No one commits suicide like that.

"They—they killed themselves . . ." I mumbled, unable to accept what had happened.

The girl gasped, and I looked at her. Her face was beginning to loosen, her tenseness was ebbing away. As though she had just moved a mountain with her mind, she went slack, and began breathing deeply, gasping for air.

"Felara," she breathed. "Felara. I *knew* he'd help us!"

That name again. The Prince of Sygor. This thing was becoming more and more fantastic by the second.

"Felara?" I inquired. "You mean *he* had something to do with those pilots dumping their drive-rods?"

"He must have activated the Machine."

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Which meant nothing to me. "Are you going to tell me what the hell is going on here?" I was plenty mad—just by being completely befuddled! I was almost yelling.

"The Rainbow Forest first," she answered, closing her eyes, leaning back on the contourcouch and assuming a position of sleep.

I could do nothing but follow her instructions.

Sygor had changed an awful lot since I was here last, and somehow, this girl seemed the key to the mystery.

I flipped into secondary again, and made for the Rainbow Forest. Behind us—powdered and fused—the wreckage of the swoopers was still settling into the mile-deep canyon.

We were settled under the sheltering many-colors of the feathertopped trees. The Rainbow Forest stretched off, azure and green and pink and black and orange, in all directions. Underneath the huge fluffy umbrella of the treetops, the *Pitchman* was effectively concealed, and I swiveled in my chair, hands on knees, to stare at this strange girl.

"All right now," I said, "I want the whole story. If you want my help, I want the whole story."

She still had her eyes shut, but a mild derisive laugh bubbled out and across her lips.

Her face became more interesting, the longer I stared into it. Her features had character. She was not the vapid idyllic beauty of so many idealizations; her nose was a bit too small, and her lips a bit too full. But her chin was a defiant one, and her face showed lines of life. This girl was not a dye-stamped product of some wasteful culture. She had thoughts — and thoughts of consequence.

"Even if I told you the story, do you think you could help me—where an entire galaxy has failed?"

I didn't quite know what to answer. I had to try a platitude, and hope it would serve the purpose. "Look, Miss, if this thing is as big and as horrible as you've led me to believe, then perhaps an outsider can break the problem by looking at it on a smaller scale. You may just be too close to it. An objective view might be of value."

Her eyes opened quickly, and I saw her scrutinizing me with intricate care.

"You may be right," she said with terrible slowness.

"All right, then. I'd like the

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story, and I'd first like to know who you are."

She sat up, and suddenly realized she was half-naked. Yet her face remained impassive; she didn't blush, and she made no adolescent movements to cover herself. She was a woman, and proud of the fact.

"I am Vedria, Princess of Sygor, sister to Felara."

She said it the way she would have said it were she receiving in the alabaster hall of the Palace. I didn't doubt it for an instant, of course. Even if I'd wanted to, that regal face would have convinced me. And it all added up when I stopped to think of it.

"Then why hasn't your father, King Lormell, solved this problem? From what I've heard of him he's a pretty hard-headed old . . ."

She cut me off, waving her slim hand in annoyance, as though wiping everything I had said from the blackboard of meaning. "My father is dead. Felara is King."

"Dead? How dead?"

"How? By Aslik's hand, and the hand held a triple-thread. He was murdered on his balcony, addressing the people—telling them," and she seemed on the verge of a scream, "*not to resist the invaders any longer.*"

This whole thing was beginning to shape up. But oddly-shaped, because I still didn't have any idea who Aslik was, or where the invaders had come from, or any one of a million other questions.

I asked her to tell it from the start.

"Are you familiar with the Spinxa Cluster?" she asked.

"I don't hit it on my trading route, no," I shook my head, "but I'm familiar with the territory by reputation. Why?"

"Two years ago a petty emperor named Aslik rose up from somewhere in the Spinxa Cluster, and began overruning every world in sight. He's conquered the entire far end of Galaxy 5—in two years."

It was the most fantastic thing I'd ever heard—and also the most illogical.

"But why?" I demanded, incredulously, "it's been statistically proven there's no margin of profit in space-conquest!"

She shrugged her pretty shoulders eloquently. "He says 'territorial expansion' but I say just the lust for power. The man's mad, and there's no stopping him." She let a different tone slip into her voice, "Oh, of course he conquered a great many of those

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planets by the sheer laziness or inadequacy of the residents —there's never been any war out here—but there's been a great deal of fighting. Actual, out-in-the-open combat, and the waves of terror are spreading all through the center of the Galaxy."

Had I been standing, I would have sat down with a plop. But I wasn't, so all I could do was rake my hand through my mop of red hair. "This is unbelievable!" I murmured.

"Unbelievable or not," she replied, "it's so. And that's it. They came rumbling out of space, and one day they were here. The ruins on the other side of the planet, near Capitol City, would convince you. Almost one-fifth of our population was killed in the first two weeks of fighting."

I computed quickly.

"Why did the battle for Sygor take so long? Why hasn't Aslik moved on?"

Her face deepened its expression. "The Machine," she said.

"Machine? What Machine?" I had to use the capital . . . she had, with great meaning.

"It's a robot," she said, then stopped abruptly. "Just a weapon, that's all. No more of that now. If you want to help, all you can do is help me get back to Capitol City. There's nothing more you can do."

I wouldn't let it rest there. "Vedria, my name is Martin. Loper Martin. I'm a trader, pure and simple. I've been ranging this section of the galaxy since I was twelve years old—with my old man. I've got no interests in this thing other than finding out what can be done about Aslik and stopping him.

"I'm a trader, with no particular planetary obligations, and the only reason I'm on your side is that they've cut me off from a good market."

"No other reasons?" she asked sardonically.

"Well . . . that and the fact it bothers me to see as nice a race as you Sygorites being shoved around."

She watched me carefully, and I had to fight from smiling. It's so damned hard not to smile when someone's watching your expressions closely.

"I almost believe you, Martin."

"Then if you do, tell me the rest of this. You're obviously holding a lot back."

"I said I *almost* trust you."

"Dammit woman, you've got no other *choice!*"

Her face suddenly dropped all expressions of mock brav-

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ery and I saw naked fear course in her eyes. "You're right. I've got to trust someone. It may as well be you."

"Then tell me."

"All right," she said resignedly. "When Aslik's fleet came down, they started using their big twenty- and forty-thread beams on the cities.

"So father—that was King Lormell—went down to the vaults beneath the Palace where the remains of the Elder Race's scientific apparatus had been stored when discovered, and activated the Machine."

"What's this about the Elder Race? I've never heard anything about—"

"They were using Sygor as a base of some kind, eons ago, and were long gone by the time we were mature enough to even suspect they'd been here. But they left some of their implements behind, and through the years father was able to discover bits of their usage. The Machine was one of those weapons."

"What . . . what does it do?" I asked.

"It's a huge robot, sensitive to thought-patterns. When a certain key-phrase is spoken, it activates the robot, and the Machine then turns a lethal sort of mental ray on anyone thinking those particular thoughts."

I was stunned. "Are you trying to tell me that if I was thinking one of these *negative* thoughts—that the robot had been trained to recognize as negative—I'd get my brains charred out?"

"That's almost exactly correct. Father had the robot keyed to the conquest and killing thoughts of Aslik and his men. In a matter of a few hours, half of Aslik's fleet had been blown up. The men had committed suicide by order of the robot."

"Then that explains the explosion of those swoopers!" It dawned on me suddenly. "But I thought you said Aslik was still here? Why didn't the robot finish the fleet off?"

"Aslik sent down a truce message, telling father he surrendered. So father deactivated the robot, and went to tell the people not to fight back any more."

"And that's when . . ."

"Yes," she cut in bitterly, "that's when Aslik threaded him down. Then his fleet settled, he took over the planet and closed it off."

"But why didn't he move on? Why didn't he fire on me when I showed up?"

"He wants the robot. He

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can't go on till he gets it. The Machine is such a perfect weapon, he wants it to conquer the rest of the galaxy. He knows he has to stay put here till he can get it, so he's been warning away any ships that come in from space. Till he can get the Machine. If they don't go away, if they get suspicious, he shoots them down."

There was one thing bothering me. "Well, why doesn't he take the robot and go?"

"He can't get to it," she answered almost desperately. "It's down in the vault-maze; and even if he *did* get it, he couldn't use it because he doesn't know the activating phrase."

It was all painfully clear now.

"Then he can't ever get the robot—because your father died with the secret." I thought that settled the problem on that score.

"No, that isn't so," she answered. I stared, startled.

"Felara knows it," she said simply.

"Father told him what the phrase was, before he died. Then he had it hypno-buried, so my brother could only remember it under great stress or mental connection."

"Mental connection?" I started, the incident of the swoopers exploding coming back to me sharply. "Are you trying to tell me you and your brother are—"

"That's right," she nodded, "we're two-way telepathic. Sometimes," she added hastily.

"Then you were trying to contact your brother, and he felt the tension, activated the robot telepathically, and the Machine made the pilots dump their drive-rods."

"That's what happened," she agreed. This thing was getting more deadly involved by the second. A royal family of Sygor; royal because they were inbred-telepaths! A family trait!

"Well then why doesn't your brother just activate the Machine and let it finish off Aslik and his men?"

"They've got him prisoner in a Pleasure House, where he won't feel any stress. They're using every subtle trick to get him to divulge the phrase, without activating the Machine. He's under narco-stim almost the entire day, and they're probing, probing, probing continuously."

"They haven't been able to crack him yet," I murmured to myself, astounded at the strength of a fifteen-year-old boy.

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"No," she agreed sadly, "they haven't. And that's why I was being dragged."

I looked at her questioningly.

"Aslik had Felara watching on a viewer as they dragged me. He said they'd kill me if Felara didn't co-operate with the narco-stim. He must have agreed, and then they cut the picture, and Aslik gave the command to finish me off with the dragging.

"Right now, Felara may be helping them get to the phrase, thinking he can save my life. If you hadn't come along, I'd have been dead, and there would have been no chance."

I sat back, feeling as though I'd been wrung dry.

There it was. I'd saved the Princess of Sygor; her brother-the Prince—no, the King, now!—was in the hands of a ruthless madman from somewhere in space, who was viciously probing the boy's mind for the key to the deadliest weapon I'd ever heard about.

It wasn't a pretty situation, and I was sorry I'd offered to help. It seemed as though Felara, Sygor, and this end of Galaxy 5, were doomed.

And perhaps the rest of the Galaxy, when Aslik got that Machine.

I felt about as useful as kitchen utensils to a no-armed, rock-eating Biiyuk native. I was only Loper Martin, not the Saviour of the Universe. I was only a traveling salesman, not a bulging-biceps warrior!

Vedria's beautiful face was sunk in terror and hopelessness. And as I swiveled around in the control chair, a feeling of hopelessness beating at me, I caught sight of my own face in the burnished panels of the CourseComp. It wasn't *my* world—but we both had the same expression!

I couldn't decide what to do, but I knew one thing: we needed help.

"Vedria," and she turned her face from the wall, to stare at me. A guy could easily forget she was a Princess—she was more woman than ruler.

"Yes?"

"Look, I know you want to get back to Capitol City, and get Felara out of Aslik's hands, but we can't do it alone. We've got to get out of here and come back with help. We're the only ones free, who know Aslik is bogged down on Sygor.

"If we can get out and run the half light-year to Choom-

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lik, we can contact the space navy there, and bring back enough heavy stuff to crack that Barrier . . . perhaps catch Aslik's fleet in dry-dock."

There was mute appeal on her face, but she didn't argue. Suddenly her voice was compliant, as though she had worried the situation so long, she was weary of it. "Whatever you say."

I knew I couldn't cheer her, but I tried to break the tension. That half light-year run was no picnic jaunt, and I thought it would be better on both of us if she were more at ease: "You can call me Loper," I chided her.

She didn't answer, just let a tracery of smile flicker and disappear.

"We'll get him out okay, you'll see," I reassured her hollowly, and tossed the *Pitchman* into secondary.

Nothing happened.

The dials didn't stir. The drive-rods didn't slam into place. The roaring didn't begin, and the ship didn't shudder.

Nothing happened.

I examined the dials. It wasn't a bugaboo in the system. The damned dials weren't registering *anything!* Not even amount of fuel or the time on the chrono.

Then it dawned. Nastily, frighteningly, unhappily—but it *did* dawn.

The dials were hooked into the electrical system. They weren't working, the ship wasn't working; ergo, the electrical system was dead. Ergo ditto, the ship was dead.

We were trapped on Sygor.

I gave the story to Vedria quickly, outlining it as best I could. "Whatever kind of Barrier they've slung up there —and there are hundreds of *kinds* of Barriers, you know —they've jazzed it up somehow, and its blanketed off our power source."

"We're stuck," I said.

"Martin," she began to ask, but I raised a finger, and she remembered, smiling . . .

"I mean, *Loper;* do you really want to help us?"

I could only nod my head. I was more deeply involved now than I'd thought I could be. On Choomlik I could have sat back and said, 'Let the navy handle it, I'm only a salesman,' but Choomlik was far away, Sygor was in trouble, this girl was quite beautiful, and I didn't like my markets being eaten away by a maniac named Aslik.

There were too many good reasons for me to refuse. "Yes, I want to help, Vedria."

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She sat up on the contour-couch. "There was a reason I asked you to bring me to the Rainbow Forest," she said.

I arched a copper-colored eyebrow. "There was?"

She nodded. "Do you have any hand-weapons?"

I palm-pressed the panel by the cab door, and a rack of three-, ten- and fifteen-thread disruptors slid out.

"You'd better take a fifteen-thread," she advised, plucking a three-thread hand-pistol for herself, and pointing to the fifteen-thread automatic rifle in its sling-rack.

I took it down, thumbed the magazine open and quickly assayed the five hundred minute — but deadly — charges racked together. I was ready, but I didn't know for what.

"Let's go," she said, and made her way belowdecks. I unlocked the sphincter, and when we came to the outside hull I took a quick look-see through the port. The Forest was dead-silent as far as I could tell. She nodded for me to undog the port.

The Forest was empty, as far as I could see, but it wasn't quiet. Sounds melted into sounds. The weird pulse pulse pulse of bird's songs interposed across the howls of animals. The murmuring of the feathertop trees. The beat of the branches. The sound of the growing land. The Forest was a live thing, flooded with color, flooded with noise, flooded with life. Empty? Not a bit. The Rainbow Forest was a wilderness of existence. But none of it came to me as danger.

This was the sort of place a wanderer like myself could set down and never leave. Ever-changing, yet familiar from the first.

But I had no time for that . . .

"Why here?" I asked. There seemed to be no logic to our landing here. We were around the other side of the planet—not even on the same continent—and hopelessly unable to bring aid to *anybody*, much less Felara who was being watched by Aslik.

"I'll show you," she said, and we walked into the Forest.

Streamers of azure and green and gold ran off through the trees, and the soft wind bubbled through the massed feathertops. As we walked, the springy gray soil of the Forest sank under our feet. Birds took to flight, slicing away on pinioning wings of many colors.

We walked steadily, follow-

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ing a twisting, involved path, for almost an hour. The daylight blocked off above the trees, and the Forest sank into gloom deeper than I'd ever known.

Vedria didn't say a word, and actually, I was grateful for that. I wanted to think—think about a lot of things.

This situation on Sygor was a new one, of course. There just wasn't any percentage in space war. The distances of space—and even the warped expanse of inverspace—were prohibitive. Send a fleet out, and perhaps five years later you might learn they'd been annihilated, or that they needed supplies. So if they were wiped out, you had to start fresh, from a time-lag of five years when an enemy could get to *you*. If they needed supplies, you didn't bother about it, because it took five years for the message to get to you, and another five for the supplies to get there.

Ten years? No, space war was a game for madmen.

Aslik had started a space war. Ergo, Aslik was a madman.

But the madder they came, the more dangerous they could be. And it seemed this galaxy-master, this mad Aslik, was the most dangerous of all. He had swept out from the far reaches of the tiny Spinxa Cluster, and now here he was—hundreds of thousands of light-years away, and in only three years. It was a tribute to a man of daring, and a man of wild purpose.

There would be no underestimating Aslik.

Nor did I oversell myself. I was a space trader—a dealer in valuables—from world to world. A man with no home, and only a ship beneath his boots. They said I spread culture where I went, bringing news and trading, but I'd always laughed at that: seers were always ready to slap handy tags on wanderers like myself.

I was a gypsy and I knew it. I never tried to be anything more. When a six-foot blond with black eyes named Loper Martin thundered down into atmosphere, all I expected the natives to say was, "Here comes the trading post! Get out the colored beads!"

And here I was, a trading post, embarking on a mission to save a galaxy. I was much more than staggered; I was stunned.

"Much further?" I asked Vedria.

She didn't turn around, kept walking. "Not much," she answered casually. She

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was holding the three-threader loosely, so I assumed there was no danger.

I thought a little more of the Forest, of Sygor, and of this proud, high-born woman walking before me. There were enough factors there to make me want to settle down for good on this many-colored planet.

If I came out of this with anything approaching a whole skin, I was going to look into it.

Then Vedria stopped, and indicated a tree-trunk.

"There," she said, and stepped back. "Lift it up."

I walked over to it. It was firmly anchored into the yielding soil of Sygor. "You mean disrupt it?"

"No," she said quickly, motioning my rifle down, "I mean lift it."

I tossed her an odd glance, and she smiled, motioned me to do as she said.

I stepped closer to the tree-trunk, and gave it a shove. It moved slightly. I slung the rifle across my back, and heaved at the trunk. It came up a little.

I dug my boots in, and put my shoulder against the thing. It started to edge up out of the soil, and little pieces of dirt that had built up around the edges, tumbled under. There was a huge hole under the tree-trunk. I continued to heave up, and it was lighter than I'd thought—but not *too* light.

In a minute the thing reached mid-point and its own weight held it up. It was counter-balanced beautifully. The ground was a milky-white, around the edges of the hole, under the trunk, so I knew someone had used a depressor field on it.

Vedria stepped over to the hole, and I noticed a huge, winding staircase that went down into the ground. She started down it, and I grabbed her arm.

"Hold off a second," I said warily. "You may trust me, and this may not sound gentlemanly, but for the first time I have a little doubt about *you*. What's this?"

She grinned up at me, but it was a wan smile. "My father showed me this years ago . . . and told me if I ever needed an escape route from the Palace, this was it."

I shook my head. It didn't make sense. "The Palace? But the Palace is in Capitol City, halfway around the planet."

"Yes," she said slowly, "I know."

She started down the stairs

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and I couldn't do anything but follow her. The darkness was thick as musk, and as we went down, she said, "Pull that lever in the wall."

I looked where she was directing, and pulled down the lever. It came down heavily, and I knew instantly what it was. The counter-balance for the tree-trunk trapdoor. Even as I pulled the lever to its bottom notch, the tree-trunk shivered at its tipping-point, and fell with a clang. All light was instantly blanked-off, and the staircase was an ebony nothing stretching below us. I started to press my cigarette lighter, but I heard Vedria say, "Give it a few moments. It's over four hundred centuries old, and there are slowdowns all along the system."

I had no idea what the hell she meant, but I put my lighter away. A few seconds later the staircase began to glow, and a moment later the entire shaft—and I could see now it was over a mile deep—was brilliantly lighted. I could see no fixtures, and the light streamed around us evenly from some hidden source.

"What — what *is* this place?" I asked.

"The Elder Race built it. It goes down to . . . well, you'll see soon enough. But this may be the one way we can save Felara and stop Aslik."

Then she pattered ahead of me, down and down and down the winding, spiraled staircase.

I followed her, marveling at the inlaid stone of the passage walls, and the length of each step platform. It took me three steps to cross each one —and I'm six feet tall.

Whoever these Elders had been, they were a giant race, and no mistake.

I followed her silently, only the slap-slap of her bare feet and the clump-clump of my boots making any sound in that passage. A passage which had been constructed long before the Earthman had exploded into the night of space, and long before the men of Aslik had threatened that explosion.

To say it was unbelievable, would be beggering the place. It was the *most* unbelievable place I had ever been in.

It stretched up, up, and up, through the ground, for a full mile, and it ran on so far I could only see a golden distance. It was a metal tunnel, completely without break or seam. Like some river of gold that had solidified, and had made a tube in the earth. Without protuberance, with-

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out attachment, without bulge or break.

"This was made by the Elders." I said it. There was no question. It had *had* to be made by them; no mortal man could have constructed such an edifice.

"Hundreds of thousands of years ago," she said, and her voice was a sibilant whisper. Yet it resounded echoingly down that expanse.

"What is it for?" I asked, hoping the answer would be one I could conceive in mundane terms.

"It is an anti-gravity subway," she answered, and I knew I had not received my mundane answer.

"I don't understand," I said.

"You will in a moment," she said. "When I key it on."

I was about to ask her where it led, what it was composed of, what other uses it had, but she simply said, *"Thawk-ulla!"* . . .

. . . and I was lifted up and hurled.

It wasn't a force, it wasn't a catapult. It was as though my body had lost all weight and substance. As though I was a power-driven feather, shot from a blow-gun. I felt *something* on my body, however, that kept me from touching the round inner wall of that tunnel. It kept me in the center of the tube as I was driven down its expanse.

My breath was not ripped from me, and no sensation of nausea hit me, as I'd half-expected. I was merely traveling, as I might be traveling in a sport-jet or the *Pitchman*. At an incalculable speed—a speed that blurred the golden tunnel about me to a whisper of shimmering nothing.

I couldn't see Vedria, but I was sure she was nearby. And I traveled. Faster than I'd ever believed anyone could in normal space.

It couldn't have been more than three minutes, but I calculated we had gone under the Rainbow Forest, under the canyons, under the gigantic sea that spread itself blackly across half the planet, and further.

Then, as I began to wonder if I would ever *stop* this wild flight, I did. I came to a slowdown, and the next moment I was standing—whole, unexcited, breathing normally, and thousands of miles from where I had begun—in the other end of that tunnel.

At the other side of the planet Sygor in Galaxy 5.

"We're under the Palace," Vedria said, her words muffled by the blackness of the

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caverns about us. "In the vault-mazes."

I was still bewildered from the vastness of the trip I had just made. Across a planet, in less than three minutes, with no visible means of transportation, sensations I had never known before.

"How do we get out, and what do you think we should do?" I asked.

"I'm — not — quite — sure . . ." she said, and I could tell there was a worried expression on her face. She had taken a bold step—led me to the Rainbow Forest, led me through the Elders' subway, led me to this spot beneath the Palace—but was now at a loss for plan.

"I remember coming down here when I was very young," she said, "and I've always had a good memory. I thought I remembered the passages in this maze, but . . . but they seem to be different. Perhaps if we walk a little, I'll remember the way."

So we walked.

The passages wound off each other, straightened, ended in deadways, doubled back on themselves, wound in spirals till they narrowed to false corners, stretched for immense distances, only to end where they had begun.

We walked for three hours by my chronoring, and finally we sank down in the dust of the maze, totally lost, and knowing it.

"I don't remember," she said unnecessarily.

I slumped against a wall, wondering if this was where my years as free-trader would end. In a dust-hole under the Palace of Sygor.

Then the wall shifted, slid back on a pivot, and realigned itself. The maze had changed subtly.

The movement started other movements, and all down the way I heard other walls lifting, other walls still lowering, and more walls remolding themselves.

"My God!" I cried, "they've constructed this thing so it shifts itself. No wonder you can't remember the way it was when you were a little girl. The thing changes every time someone leans against a wall.

"You said Aslik's guards had been down here trying to find the Machine?" She nodded. "Well, then it's obvious this damned thing has been shifted many times. We're trapped. And if we don't rot to death, we'll starve to death first."

If I sounded bitter, she couldn't have held it against

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me. I was lousy with bitterness. I didn't much feel like dying.

In the darkness I could only see the movements of her, not the expressions, but I sensed something was wrong.

She didn't answer my tirade, but her body stiffened, and I knew she had gone into one of those deep-trances with her brother Felara.

"Fuh — Fuh — Fuh — Felara!" she whispered, and then got up.

She didn't say any more, just started walking. I had an idea the stresses had been set up, and Felara was homing us in. Whether he was doing it properly or not, I couldn't tell. But I stayed away from the walls, so he wouldn't have more trouble. Once, Vedria touched one of the twisted walls, and it rolled into the ground. All down the line new walls shifted into position, and she abruptly changed direction. The boy was doing a good job—conscious or unconscious.

Finally, I saw light tinging the walls, and a few minutes later we came out into a huge amphitheater-like place, pillars rising to the dome of carved glassite. The light streamed down blindingly, and Vedria gasped as she was struck full-force by the shafts.

She snapped to wakefulness and passed a hand through her matted blonde hair. "What . . . the mazes . . . where are . . ."

And then she saw where we were, and she gasped out, "The vaults! The Machine! It's here! Here, Loper, it's in here somewhere!"

I looked around and saw the crypt-like doors—twenty feet high each—set between the pillars. They were faceless black, with a ring-pull set in each.

I walked to the nearest one, and touched it. Though it was almost uncomfortably warm in these subterranean crypts, that metal was chill-cold . . . a frightening contrast.

I drew back. "Which one is it?" I asked Vedria. She came toward me, and I felt her hand on my arm. It was the first time she had touched me voluntarily, and somehow it eased the pressure off me.

"I—I don't know," she said.

"Well, contact Felara and find out which it would be."

She strained then, and her brow knotted and her fists clenched and her body trembled, but after ten minutes we both knew the connection had been broken.

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"Why? What's the matter?" I asked.

"They may have him in some kind of prohibitive deep trance, or he may be using his telepathy elsewhere, or—" then she gasped, and said, "—*no!* I know why he won't answer. He knows if he connects with me—and this is all subconscious—to let me know where the Machine is, he'll trigger off the thought of the key-in phrase, and activate the robot.

"And with us down here, thinking death at Aslik, the robot would char our brains as well as any of Aslik's guards!"

I moaned low, and she turned to me. Her face was a study in beautiful urgency. "Loper, we've *got* to find that Machine!"

"Well," I said, "if there's no other recourse, there's always this little fifteen-thread disruptor over my shoulder."

She looked dubious, but I spread-legged myself in front of the nearest door, thumbed off the safety, and depressed the firing button.

The solid blue threads of agonizingly released energy streamed out—like a line of rope, like many lines of string, all bundled together and traveling together—splattered against the door, and crackled off into nowhere. I released another burst. It spattered energy across the width of the amphitheater. The noise of the *szzzzz-crkkk!* filled the place with echoes, and smoke rose up.

But the smoke rose up only from the dust that had collected through the centuries, because there was no harm done the door. It was solid and unmarred as before I'd shot.

Whatever metal that door contained, it was like no alloy I had ever seen. I've been from Pocopuss to Xenaly IV, from one end of the galaxy to the other, but I've never seen a metal with those fantastic properties! It was completely impervious to anything I could throw at it. I walked over and ran my finger tentatively over the spot where I'd aimed.

The metal still held that queer chill feeling.

Vedria moved up behind me, and the chill had spread out from the metal, run through my hand and slunk down my back; when she touched me again, I jumped, and whirled around with the fifteen-thread aimed at her stomach.

The tenseness in me eased, and I unloosened, letting the

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rifle slide down. "I don't much care for your Elders, Vedria," I said. The entire set-up bothered me. To be frank, it *scared* me. I wasn't at home with any race who could construct metal to withstand compressed energy.

"They frighten me sometimes, too, Loper," she answered.

But we were no nearer finding the Machine than we were to rescuing Felara.

There were fifteen doors, and each of them was solidly shut. Or *were* they solidly shut?

With the mazes being what they were. it was a safe bet no one had found the amphitheater. And if no one had found the place—except King Lormell when he'd come down to activate the robot—then one of these doors had to be open.

"Start pulling the rings!" I yelled, and yanked on the one in front of me.

It slid open smoothly, without effort, on an axis-pin, and I was staring into the smooth, gray-metal bulk of the Machine!

I stared up at the thing. When Vedria had said, "It's a robot—just a robot—that's all," I'd imagined some small, boxlike utensil-robot; the kind they use at the spaceports. There was nothing to lead me to believe otherwise . . . there wasn't another robot like this in all of Galaxy 5!

It was a staggering twenty feet high, with an almost humanoid body: gigantic triple-wedged feet, massive jointed arms, a torso of the queerly cool metal, and a head atop the body, swiveled and ready to revolve a full three hundred and sixty degrees.

The face was a mechanical travesty of a human's. The eyes were coil-receptors, red and spiraling. The nose was non-existent, and in its place was a thin, tube-like projection, with a robot-sight on it. I had the vague sensation of worry that the tube was a weapon—a very accurate and *deadly* weapon. The mouth was a rectangular slash of mesh-grill.

At the side of its square head a small box rose out, and a whipcord antenna straightened itself from the box.

The thing's hands were the most fearsome of all. They were split into a pair of pincers, much like a soft-shell crab of Earth. The pincers, however, were not soft-shell; they were the queerly cool metal, and there was blood—dried and flaking—on them.

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With one vicious swipe of those hands, the Machine could rip a man down the center like opening a package of quick-freeze asparagus. I moved back from it, and watched the thing silently.

Vedria, who had run to try another door, and had not looked over my way for several seconds, now did so, and gasped.

"You've found it!" she exclaimed.

"Yeah. Yeah, I found it," I answered. I was only half-happy to give that answer.

A weapon like this was fantastic. There wasn't a battleship or dreadnaught or thread disruptor or armada that could stand up to it. Constructed of the Elder's metal, and with its ability to char out a man's brain, make him alter his thoughts, defeat an army, it was invulnerable. But since it could be operated by good man or bad man, it was a double-edged sword and was not the ultimate weapon. It was only the ultimate destroyer.

I couldn't look at it any longer.

I've been in some pretty unpleasant situations: I've fought with spider-things from JawkThor, I've battled my way out of a blockade ambush off Galipolii, I've had to pilot the *Pitchman* through a swarm of meteorites, the hull riddled and air seepage mounting—but I've never been so frightened as I was, just standing there and looking at that God-awful Machine.

I prayed, deep within myself, it would never be turned on me.

As though it had heard my thoughts, as though it had drawn some life-power from somewhere, the Machine's blocky head swiveled on the torso, and tipped down. The spiral eyes glowed red and fierce, and I seemed to detect an almost machine—like hatred blazing out at me.

Vedria screamed and stumbled backward. I was a step on top of her. I pulled up the rifle and aimed it.

Before I could push the button, knowing it would do no good, but having to do *something,* Vedria knocked my hand down, and away from the button.

"No!" she gasped urgently. "Think pleasant thoughts. Don't think death or destruction!"

So I thought pleasant.

I thought of the birds and the bees, I thought of beautiful women like Vedria, I thought of the Rainbow For-

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est and of the clear black of space when you leave inverspace. I thought of my mother and father, long since gone to their rest on a fungus-planet called Luxor's World. But that got me onto death again, and I had to think of my kid sister, somewhere back on Earth. All the pleasant thoughts stumbled and bumbled through my skull—more of them at one time than I'd had in the last five years.

It seemed to do the trick. The Machine kept watching us, but it made no further move.

Then, it went dead again.

"Wh-what the b-blazes was *that* all about?" I shot at Vedria. I looked at her quickly, and saw she was in that telepathic trance with her brother. She was straining and sweating, her fists clenching and unclenching spasmodically.

Then it all faded, and an expression of utter weariness hit her. "He's dead," she said.

I didn't say anything. What *could* I say? I hadn't seen the Prince of Sygor, never met him, but his efforts in our behalf, even while under deep trance by Aslik's hand, had been enough to nominate him my personal saint. Now he was dead, and the two-way connection was broken between Felara and Vedria.

"God rest him," I said.

"A lot of good that'll do him!" Vedria spat. And her face was a mask of intolerable fury and hatred. She wanted blood, she wanted death, she wanted Aslik's head ripped off and thrust bleeding atop a pike, to be carried into the Forest, for the animals to dispose of.

"He died under trance. They had him in a Pleasure House, so he wouldn't feel stress and activate the Machine. But they used too much trance-serum on him, and he died. But he got one last message to me! One thing he said!"

I was listening to the new ruler of Sygor, but it didn't sound like a ruler. It sounded like a sorrowful and confused girl whose whole family had been wiped out.

"He gave me the activating phrase for the Machine. The movement it just made was his trying to convey it to me mentally, even under trance.

"And now that I know it, Aslik won't get another chance to rule the galaxy!"

She turned to the Machine, then, and cupped her hands to her mouth. "*Deliver Us Oh Machine From Death!*" she

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screamed, and instantly the robot came to life.

Its eyes lit up, its antenna-box turned slowly, and its huge hands closed with a clang!

Then it took a halting step forward, and I heard its leg-joints sizzle. As it moved. I caught a glimpse of one of those joints. *They weren't connected!* The jointed segments were held apart, by some sort of force-field. The thing moved then in a free, swinging motion, and two steps brought it out into the center of the amphitheater.

Orders, it said.

Orders, give me your orders. I am keyed to your orders. And the voice was like the crack of doom through a metal tube. It sounded high and roughly and bounced back to me from the arched expanse of the dome. The place resounded with the voice of that metal destroyer.

"Is it wise to use him?" I asked Vedria, and I had a fear that this Machine might be a greater peril than even the mad tyrant, Aslik.

"Use him?" she asked, her voice high and nervous. "Use him? You bet I will. I'll grind everyone of them into the soil of Sygor! They'll go back to the Spinxa Cluster and never come out again.

"Lift us to your shoulder!" she commanded, and the thing bent toward us. One hand reached out for Vedria, lifted her carefully and set her on a flat, platform-like plate on its right shoulder. She grasped the railing around the plate, and the Machine bent for me.

Its metal hand closed smoothly, and I felt pressure around my waist. Then it had me swinging up and around, and an instant later I was standing on the left shoulder. My boots clicked to on the plate—though they weren't metal—and I was held almost magnetically.

"Now," Vedria spoke sharply, her words commanding, "find the Palace Pleasure House!"

And the Machine turned, strode out with long, smooth glides through one of the tunnels. He strode with a faint sizzling coming to my ears, and he hesitated not a second at corners or junctures.

Finally, the passages of maze came to an end, and we entered a corridor of natural stone. The Machine didn't hesitate there, either.

One metallic fist slammed against the wall, and it crumpled to stone-slivers beneath

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his blow. He stepped through, and we were in a stairwell.

"This leads to the Palace wine-cellar," Vedria yelled to me, around the robot's head. "He just came up from the burial vaults and the sub-cellars."

And twenty minutes later, we *were* in the Palace!

The first guards that saw us were clothed completely in black and scarlet. They were lounging against a wall, guarding a door. The Machine came through the opposite wall, directly in front of the four men of Aslik.

The Machine's fist came through first, splintering metal supporting rods in the wall, crushing stone, showering plaster around the men. Then the huge automaton stepped through, and the little tube in its head showed what it could do.

Sickeningly.

The tube sprayed out a fan-shaped wedge of blue light, wrapped itself about the four guards, and they turned their thread-disruptors on each other. For a ghastly second the corridor was filled with the smoke of charred bodies, then they fell, almost as a man, and the smoke rose lazily, as we stalked away, riding the Machine.

It was that way throughout the Palace, till we finally came to a forty-foot glass door.

This is the Palace Pleasure House, the Machine said, and stopped dead.

"Enter!" Vedria said, and then, "Find Aslik and his guard! Wipe them out!"

I was horrified at the tone the girl's voice had assumed, but I knew it was a result of all the terror and agony she had gone through. Her planet overrun by a madman, her father and brother killed, herself dragged into space, and the sheer horror of being thrust into contact with this deadliest of all weapons.

I couldn't blame her, but it sickened me, nonetheless.

The robot strode forward, and I ducked behind the antenna box as he shattered the glass door.

Slivers of crystal ricocheted off the metal body, and I saw Vedria crouch down as an entire section of glass shattered across the metal beast's head. Then we were through, and into the Pleasure House.

I had heard about this place. It was maintained for friends and political relations of the King—those whose minds were on the pleasures of the flesh. As we burst through the door, the harem

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women went scattering in all directions, through cubbys into the walls, and under the hundred beds.

In the center of the room, on a high table, with five white-coated surgeons around him, was the body of Felara. It had to be Felara.

He was bloated blue from too much deep-trance serum.

Dead, of course.

"Anyone allied with Aslik! All of them!" Vedria screamed at the robot. "Kill them!"

The robot lumbered forward, and even though I knew Aslik and his men should be put down, this mass slaughter was unbelievable!

"Vedria, *no!*" I yelled.

She wasn't even listening, she wasn't aware of anything but that bloated blue body on the table, and the men of Aslik.

"Oh, Machine, stop! Deliver us not from Death!"

It wasn't Vedria, and it wasn't me. I looked across the tapestried and bejeweled central room of the Pleasure House, and saw him for the first time.

There was no doubting who it was: Aslik!

He stood wrapped in pressure-armor, his head half-covered by the warp of a battle-helmet, and he raised his arms to the ceiling, and the Machine stopped.

Vedria gasped, and it was clear in the sudden silence of the Pleasure House. "I got the key-phrases from your sniveling brat of a brother before he died, my dear," the madman said, and his dark face was split by laughter.

"Now we shall see who will rule Galaxy 5!"

I got a good look at him, in that timeless instant; a big man with a body like a bull. A face of darkness and eyes of cast-iron. A nose that was no nose at all—merely a protuberance. A mouth that was the mouth of a terrestrial crocodile. And the manner of a man who has seen the galaxy as a back-yard—and who has chosen it for his own.

That was Aslik, and I saw all this in the instant it took him to raise the three-thread hand-disruptor. He lifted it, aimed it, and the intertwined blue threads *sizzled* up toward the head of the Machine.

The blast was intended for Vedria, and if it had hit, her body would have been ruptured and torn, exploded outward like a puff of foul air, to spatter the walls with flesh and bone bits. But she saw Aslik's movement, and ducked down behind the bulge of the Machine's neck. The bolt

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slashed up and sprinkled itself uselessly off the robot's body.

"*Move Oh, Machine! Move! I command it!*" Vedria screamed desperately at the robot. But it did no good.

"*Stay where you are Oh, Machine!*" Aslik directed the robot, and the Machine began to smoke. From its eye-spirals came thick ropes of black smoke. From the unconnected joints of its body the smoke poured in a blackening tide. From the mouth-grill and from the antenna-box near me—the smoke billowed and spun out chokingly.

"Vedria! Vedria!" I gasped abruptly, realizing what it meant, "get off, jump down! Slide down the Machine's back! It's going to explode! It's got too many contrary orders . . . you and Aslik have it locked in directives! It's gone schizophrenic—it's going crazy—it's about to blow its circuits!

"Get off! Quickly! I'll cover you!"

Aslik had seen the smoke, heard my voice, and for the first time seemed to realize Vedria was not alone. His guards drew toward him at this sign of danger, but he motioned them back a step, and raised a pointing finger to me.

"So!" he bellowed echoingly in the Pleasure House, "*You* are the meddling intruder who would not take a warning and leave Sygor! Well, we shall see how you'll take the warning *now!*"

And up came that three-thread. The beam spat out, *sizzled* toward me, but I wasn't there any more.

I dove off the back of the robot, fell toward the wall, and grabbed a tapestry to break my fall. The rifle bumped painfully against my back as I slammed into the wall, and felt the tapestry rip under my hands, but it let me down gently, and I turned around quickly, to crouch and aim at Aslik.

Before I could draw aim, the robot exploded.

It spat sparks, billowed more smoke, and then, with one agonizing shriek of rent metal, the thing flew apart deafeningly. I was knocked flat by a section of leg plate, and pulled the tapestry over me as shrapnel continued to fall.

Off to my right I heard Vedria scream, and prayed she had gotten off the Machine in time.

A few minutes later I looked out. The Pleasure House was a shambles. The beds

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were aflame; the walls were pocked by flying metal, and plaster dropped like snow; the huge table on which the dead Felara had lain was overturned; the Machine—of course—was gone, and so were half a dozen of Aslik's men. They lay stretched in weird positions on the floor, bits and shards of metal protruding from their heads and bodies.

Then I heard the moaning wail of a madman. I looked up, and there, on a balcony, at the far end of the Pleasure House, was Aslik. Wrapped in battle-armor, carrying his three-thread as if it were another arm, he screamed down his hate and defiance:

"It took me three years to conquer the galaxy! Three years, and nothing will stop me! You have taken away the Machine, but you can never kill the Immortal Aslik! I shall live on and rule on and conquer on and . . ."

Vedria slid out of the rubble at my feet, ripped the fifteen-threader from my hands, and with the practiced skill of a woman who has hunted since she was a child, she set the lever at maximum output, and pressed the depressor.

He was a clean shot all the way.

The blast took him in the chest and face, and as we watched, his body grew, grew, grew and then—exploded!

The mad Aslik was gone.

She wanted me to stay. There was no real affection between us, of course. We were merely two people who had been thrown together in a time of war, and now that time was over.

But she still wanted me to stay.

"Why, Vedria?" I asked. We stood in the Rainbow Forest. She had had me flown across the ocean to the *Pitchman*. "You won't have any trouble with the remainder of Aslik's men. They were only poor peasants and craftsmen, shoved into fighting-ships and dragged along by the power of Aslik. Now that he's gone, they'll straggle in one by one to your jails, so you can send them home."

She looked at me carefully, her face quite serious.

"We need a man to rule Sygor, Loper. I can't handle the planet alone. I'd like you to stay . . . be the new King."

Then I realized what she was saying, what she was offering, what she was asking.

As if she had read my thoughts, she said, "That's right. I want you to marry me, and rule by my side."

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I looked deeply into that beautiful face, and for a moment I almost accepted.

Then I thought of her as she had been when we'd broken into the Pleasure House. The way death and destruction had overcome her. I thought of that, and I thought of the way she had killed Aslik. No, this woman was not for me. Not even if it meant losing the kingdom.

But actually, I thought, what *was* I losing?

I looked up into the night sky of Sygor, and watched the stars in their unending progression. I watched them march across the night sky like the sentinels of Forever.

And I knew, as I'd always known—as I always *would* know—that I was a wanderer. A minstrel of money, a pitchman in the *Pitchman*, a trading post on jets.

I was from space, and back to space I must go.

"No, Vedria," I said. "Thank you, and I wish I were worthy of you, but I'm only a trader. And one of the things I learned early in life is that a mouse should never attempt to be a lion.

"I leave lioning to the lions." She stared at me, and I thought I detected a glazing in her eyes. "Or the lionesses!" I added.

She turned away then, and ran into the Forest, the shimmer of her veils and gown billowing back like wind-vapor.

I took one last look at the planet Sygor—at this its most beautiful spot—and walked back toward the *Pitchman*. I was going to have to hurry to catch up with my routine.

There were people waiting for me to blast-in.

I slipped one foot over the port-ledge, and stopped. I looked back at the Forest. I was leaving Sygor, and at that instant, I knew one thing: I knew the planet had been soiled for me. Whether by Aslik and his madness, or Vedria and her animal cunning, I knew that here was a world that would be a brawler till the end of time. It was marked for restlessness.

It had tasted violence, and even the quiet princess of this world had learned a man must fight for what he loves. They had fought, and they had won, but I wondered how much they had gained.

I stepped into the *Pitchman* and dogged the port.

When the planet fell below my trail of flame, I headed out, knowing I would never come back. Never back to Galaxy 5. THE END

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GIFT FROM TOMORROW

By RANDALL GARRETT

Of course the best folks to deal with these extra-terrestrial snoopers would be the Army, the Navy, the Coast Guard, and the Marines. If none of these are available, though, a couple of old sour-doughs like Little Blue and Jedd will do very nicely.

JEDD RANGER automatically reined in his horse when he saw the speck in the sky.

"Ho! Ho, boy!" The animal halted obediently while Jedd narrowed his eyes to keep the sun and the dust from obscuring his vision.

Beside him, Little Blue stopped his own mount. "What is it, Jedd?" Then he saw where Jedd was looking and turned his own eyes toward it. "Bird, you reckon?"

"Jest look. Don't talk." Jedd's voice was hard.

Little Blue shut up and looked.

The dot in the sky grew, expanding itself as it approached, becoming a rounded, boat-like object. It had no wings, such as a bird would have. If either Jedd or Little Blue had ever seen one, they might have said it looked like an automobile without wheels—streamlined, wide, and low. But mid-twentieth century automobile would have looked as alien to their eyes as the flying object did.

"What *is* it?" Little Blue repeated after a moment.

"Shut up," Jedd said without rancor. Then he added: "I don't reckon I rightly know."

They could hear a soft swishing noise as it passed overhead, high above them in the pale blue of the cloudless sky.

"You know," said Jedd, "I bleeve that might be a *eri-plane*."

"That's old lady's talk," scoffed Little Blue. "Ain't nothing could fly in the air and carry a man."

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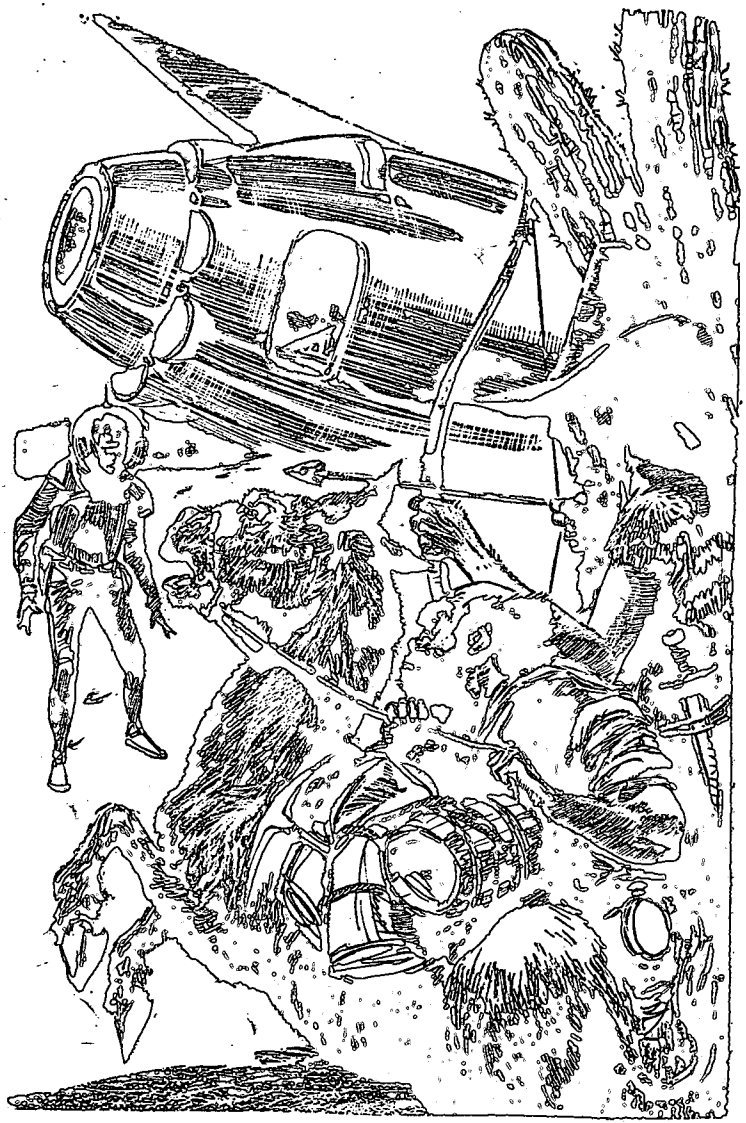

The character wore a fish bowl on his head and looked dangerous.

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"You are plain stupid, Little Blue," Jedd said. "If anything could carry a man in the air, that thing could. And it ain't an animal."

Little Blue said nothing in reply to the bigger man's cold logic.

"I wonder if it's carrying a man now?" Jedd said, his voice hard in the dry air. "I've heard tell of other folk seeing them things, but I never took no stock in 'em 'til now."

"Mmmm," said Little Blue. "They supposed to come from over the Sarahnivadas, but that's foolishness. Can't nobody live in Kafornya."

Jedd nodded silently. They both believed that implicitly, though neither of them had ever been across the mountain range of the far west into the territory which had once been the State of California. But everyone who had seen the area from a distance said that it glowed at night with a strange blue radiance and that nothing lived there. Not a plant, not an animal, not even an insect. Nothing lived there —except, perhaps, demons.

"I'd sure like to have one of them," Jedd said softly. "I reckon I'd show Hunter Jawn a thing or two."

"I'd like to kill him," Little Blue said savagely, his eyes still on the moving object in the sky. "Hunter Jawn hadn't ought to—"

"Hey!" Jedd interrupted. "Look!"

They watched without saying anything. No words were needed. The thing, whatever it was, was losing altitude, dropping down and down toward the drifting dust below. It disappeared beyond the dust-dunes several miles away. When it did not rise again, Jedd looked significantly at Little Blue.

"You—you ain't agoing after it are you?" Little Blue asked.

"You sure right, I am. You ain't afraid, maybe?"

"N-no," said Little Blue, unenthusiastically.

Without another word, Jedd twisted his horse around and trotted toward the spot where they had last seen the flying thing. Reluctantly, Little Blue followed.

Peter Hayakawa cursed fluently as he fought to keep the flier on an even keel. The antigrav units in the undercarriage were keeping it from falling like a rock, but the buoyancy vanes were acting up. He could see what had happened; one of the leads had come loose, which had automatically switched on the antigravs.

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But he didn't dare go too far on the antigravs; the power they used was too wasteful. There was nothing to do but bring the flier down in this God-forsaken Texas dust-bowl and try to repair it with the emergency kit.

It had been a long haul from Hawaii, across the calm blue of the Pacific and the deadly blue of the Coast region, but this dust bowl looked even more forbidding than the radioactivity.

He tried to pick a level spot, but these dunes didn't look too level anywhere; besides it was difficult to fight the jerks and the rolling lurches caused by the errant buoyancy vanes, and he couldn't see the ground below too clearly.

As the little flier lost velocity and altitude, he saw what looked like a fairly level spot —it looked smooth enough for emergency purposes, anyway.

Finally, the Hawaiian managed to bring the vehicle to a dead halt directly over the flat spot. He looked down. Ten, maybe twelve feet. Okay. Lower away. Slowly, the craft settled to the surface of the dust.

He took a deep breath of pure relief, then flipped the switch on his radiophone. "Peter Hayakawa, PH3272 to Lulu," he said.

"Honolulu Base to Hayakawa 3272. What's up?"

"Power leads to my right buoyancy vane fouled up. I haven't looked at the damage yet, but it'll probably take fifteen or twenty minutes to fix —maybe more."

"Check. Where are you?"

The Hawaiian gave his positional grid numbers, reading them off the panel before him.

"Texas, huh?" said the operator in Honolulu. "Okay; let us know when you're airborne again. And keep an eye out for roving nomads; they travel in pretty big bands in that section."

"I didn't see any big bands of anything," Peter said. "This desert looks deader than Hell—and I mean that literally."

"I've seen it," said Honolulu. "Well, give us a buz."

"Check." Peter flipped off the phone.

He looked around him at the flowing dust, grimaced, opened the door and got out. A hundred years ago, this had been farmland, according to those who were supposed to know. But the climactic changes after the Big Blast had changed that, although some said the process had started long before the seetee meteor swarm had struck.

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Mankind had worried for a long time before that about various kinds of self-inflicted atomic doom, but it had taken the Seetee Swarm to show that Man still had not equalled the sheer, utter hell of Nature. From the north they had come, lumps of invert, contraterrene matter, looping in from high above the ecliptic, crossing Earth's orbit in their elongated path around the sun.

Now men knew what had caused the great pits on the surface of the Moon, for they had watched those hunks of invert matter slam into the satellite, gouging new craters in flaring displays of incandescence. For when seetee matter strikes ordinary matter, the two cancel out, both of them becoming hard gamma radiation and neutrons in a blast of violence that is almost inconceivable. A bit of seetee the size of a golfball makes an atomic bomb look puny.

The orbital period of the Swarm was estimated at close to a million years. Of course, the Swarm didn't intersect Earth's orbit at the exact time Earth was there, every time it came around, but in the thousand million or so years that it had been looping in its prodigiously long ellipse, it had had several chances to do its work.

Most of the bigger ones were gone, fortunately. The big boys, like the ones that had blasted out Tycho crater and Copernicus had long since disappeared. But there were enough small ones left to inflict plenty of damage.

When the first one struck Upper Mongolia, the Great Asian People's Republic had gotten panicky and dusted California — and succeeded better than they thought. The rocket bomb sent over the pole had been caught up with by a seetee meteor batting along at something like twenty-six miles a second and literally searing its way through the sky. It had slammed itself right up the tailpipe of the descending rocket, and the resulting explosion had sent a cloud of radiodust all down the coast.

The lighter stuff, borne by the jetstream, dusted off the rest of the United States—once over lightly.

The other bombs never reached their destinations. American retaliation was swift and final. The whole thing had damned near been final for everybody.

Australia, South America, and Southern Africa had sur-

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vived pretty well, along with Hawaii and a few Pacific Islands. The Philippines had been whiffed off by radiation from Asia.

After a hundred years, Mankind was just beginning to get its collective breath back.

And, thought Peter Hayakawa, *men are tougher than they thought.*

Now that the residual radioactivity had died down here, east of the Sierra Nevadas, the half-starved remnants of the American tribes were returning.

He looked around again, but he could see nothing but dust. Shrugging, he lifted the cover off the right buoyancy vane and began inspecting the circuits.

Jedd and Little Blue lay on their stomachs behind a dust dune and watched the queerly-dressed man as he worked at the queer machine.

"I tell you, he's jest a man," Jedd whispered. "Jest a plain, ordinary man."

"Maybe." Little Blue's voice sounded dubious.

"I've heard queer things," Jedd went on, "about men from over yonder who can do things like that. And the old stories my grandpap used to tell, about when he was a little boy, before the Big Blast, everybody had things like that."

"Then how come we ain't still got 'em?" Little Blue demanded.

"Shut up," said Jedd, unable to formulate a proper argument.

"I'm gonna git me that *eriplane,*" Jedd said suddenly after a few more minutes.

Little Blue goggled up at him. "You crazy? How you gonna fly a thing like that? You don't know no magic!"

"I get that fella to teach me. *He* knows how."

"Jedd! What if he puts a hex on you or something?"

"Look," Jedd said patiently, "if'n he did, we wouldn't be no worse off than we are now. Hunter Jawn run us out of the tribe. Ain't no other tribe gonna take us. They'd kill us on sight—mebbe eat us, like some tribes do. That fella out there can't do no worse than that, now, can he?"

"Reckon not," said Little Blue after a minute. But he still didn't sound too convinced.

"All right, then. We got no one to take care of our bones if we die. But if we go back and kill Hunter Jawn with that *eriplane,* then I'll be boss of the tribe."

Little Blue nodded. The

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thought of having his bones lie untended in the desert, or eaten by one of the cannibal tribes, instead of being properly burned, so that he could get to Skyland, didn't appeal to him at all. A man whose bones weren't burned just *died*—there was no afterlife for him.

"All right, then; I got a plan figured out." Jedd outlined the plot to Little Blue.

Peter Hayakawa was bent over the buoyancy vane when he heard the voice.

"Halloo-oo-oo!"

He jerked upright and looked over the flier in the direction from which the voice had come. There, some twenty yards away, on a nearby dune, stood an apparition.

The nomad was clad in the tanned skin of some animal and wore a broad-brimmed, floppy hat on his head to shade his eyes from the blistering Texas sun. He was fully bearded, and his hair was long and caught up in a pony-tail with a bit of rawhide thong. A hefty-looking longbow was slung over one shoulder, and at his waist was a sheath that carried a foot-long knife.

But his hands were raised high to show that he carried no weapons ready to use. Nonetheless, Peter dropped his hand casually to the blaster at his hip.

"What do you want?" he called.

The barbarian blinked for a moment, then said something that the Hawaiian didn't understand at first. Then his mind focused on the words themselves. They were English.

The accent was atrocious, but the man had said: "I'm lost. Have you got any water?"

Water? Peter frowned. He had a little. If the barbarian—

Then, quite suddenly, Peter understood. No barbarian would approach an unknown thing and ask for water!

He started to whirl around, but he was too late. A sharp point was pressed against his side, and a harsh voice said: "Don't move less'n you want a stab!"

Peter froze. Like a stupid fool, he'd been trapped!

A hand pulled the blaster out of his holster.

"Careful of that!" Peter warned. "It's dangerous." He didn't mind the barbarian blowing his own head off, but he didn't want an accidental discharge ruining the flier—or Peter Hayakawa.

"All right, Little Blue," said the man behind him, "come on down and help me tie him. He ain't dangerous."

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"What do you want with me?" Hayakawa asked as Little Blue bound his wrists with rawhide thongs.

"You're gonna teach me how to fly in the air," Jedd said decisively.

"If I don't?"

"If you don't, reckon I'll kill you."

"You'll kill me anyway," Peter pointed out.

There was a moment of silence, then Jedd said: "Tell you what; you teach me how, we'll do the killing quick and easy. If not, we'll make it rough on you—real rough."

"And we won't burn your bones if you don't teach us," Little Blue chimed in.

Burn my bones? Peter thought. *That sounds interesting*. He knew that the only way he'd get out of this fix was to outwit the two nomads. It wasn't a matter of superior intelligence, it was simply that a civilized mind can understand that of the barbarian, while the reverse is not and cannot be true.

"On the other hand," Jedd said, "if you teach me good, I give you my oath we'll burn your bones proper—all the rites and everything."

Peter nodded. It never occurred to a barbarian that there were other religions than his own.

"Now, I'll make a deal with *you*," Peter said. "I'll teach you how to fly the flier and I'll give it to you if you'll just turn me loose in the desert and let me take my chances getting out alive."

"All right," said Jedd. "That's what we'll do."

The agreement sounded a little too quick to suit the Hawaiian. "Your oath," he demanded.

"My oath on my father's bones," Jedd said.

"Oh, no," Peter said, shaking his head; "on your *own* bones."

There was a long, long pause. Then Jedd's harsh voice said: "Will you swear on your own bones that you'll teach me true and proper how to fly it?"

"I will. I'll teach you how to fly it as well as I do."

"All right," Jedd said, after a time. And the mutual oaths were made.

The one thing that no civilized man wanted to think of was deadly weapons in the hands of barbarians, but—

"What about this?" Jedd asked. "You said it was dangerous." He was holding the blaster.

Peter shrugged. He hated to lose the blaster, too, but—

He told the barbarian how

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to hold and point and fire it. When the blaster seared a glowing hole in the dust, Jedd smiled. "Now we'll *really* get Hunter Jawn!"

Peter said nothing as the big man took off his holster and put it on his own belt.

"Now," said Jedd, "teach me to fly."

"You'll have to untie me," Peter said.

Jedd took out the blaster again and pointed it. "All right. But don't try anything."

"I won't," Peter assured him wholeheartedly.

Jedd cut the thongs and the Hawaiian climbed into the flier. "Get in," he said. "You are ready for your first lesson."

When they were inside, he reached out and flipped a switch. "By the way," he said conversationally, "my name is Peter Hayakawa. What's yours?"

They told him.

"Okay. Since you're forcing me to teach you to fly, I'm going to do it. Now watch—"

He kept up a steady stream of talk as he demonstrated how the controls worked.

The flier was really quite simple to handle. With one of the buoyancy vanes still inoperative, it wasn't capable of high speed, but the antigravs handled it well at lower velocities. He wished he could have gone up high and given them the full effect of a power dive, but he didn't have control enough for that kind of stunt.

Slowly, Jedd began to understand the operation of the machine. When Peter let him take over the foolproof controls, he was awkward at first, but within a few hours he was doing quite well.

"All right," he said at last, "I got it. I can handle it. I reckon I'm a real magician now."

"You sure are, Jedd," said Little Blue admiringly. "Now you reckon I could try it?"

"Not jest yet," Jedd told him. "We got to let our passenger off first."

Peter kept his mouth shut and tried to look calm. This was it; he'd held his part of the bargain—if only Jedd's oath meant as much to him as Peter thought it did.

Cautiously, Jedd lowered the little flier down to the dust that swirled beneath them. Jedd neutralized the controls and opened the door. The blaster was in his hand. "Get out," he said in a flat voice.

Peter climbed out, half expecting to feel the sudden biting burn of a blaster beam in his back, although he knew that he would never feel the

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death when it came—*if* it came.

"You, too, Little Blue," said Jedd.

"Me? But—, *Jedd!*"

Peter turned just as Jedd shoved Little Blue out of the flier and pulled the trigger of the blaster. The beam lashed out, its tremendous heat turning the water in Little Blue's tissues into steam, blasting away half his chest.

"Had to do it," Jedd said simply. "He'd of been in the way. Besides, nobody but me ought to be able to fly in these parts." He looked thoughtfully at the corpse. "I'd sure like to burn his bones; I liked Little Blue."

"The gun will do that," Peter said evenly. "See how it burned his chest?"

Jedd nodded. He aimed the weapon and pulled the trigger, firing blast after blast until there was nothing left of Little Blue on the seared dust.

"That's that," said Jedd. "You can git now. I don't reckon you'll get far without water or food in this desert."

And with that, Jedd lifted the vehicle and vanished into the sky.

He had kept his word.

It was nearly twenty-four hours before the relief flier from Hawaii found Peter Hayakawa sitting on a sand dune. He was hungry and thirsty, but otherwise all right.

The flier settled down beside him, and he sipped at the water flask the pilot handed him.

"We found your barbarian, Pete," the pilot said. "Or what was left of him. That was pretty quick thinking, turning on the radiophone first thing."

"Fine thing," Peter said, grinning. "You found my flier before you found me. Did one of the other boys pick it up?"

"Yeah. We heard everything that was going on. I thought for a while that Jedd was going to kill you. We came as fast as we could."

"I know. I'm okay."

"Jedd isn't," said the pilot. "He must have fallen from close to five thousand feet. He lived up to his part of the deal, but you didn't."

"Oh, yes, I did," Peter said. "I taught him how to fly that boat, and that's all he asked me to do."

The pilot grinned. "Yeah, but you didn't tell him that running it on the antigravs would run it out of fuel fast. You didn't even tell him it would run out of fuel at all."

"You know why?"

"No."

"He didn't ask me." THE END

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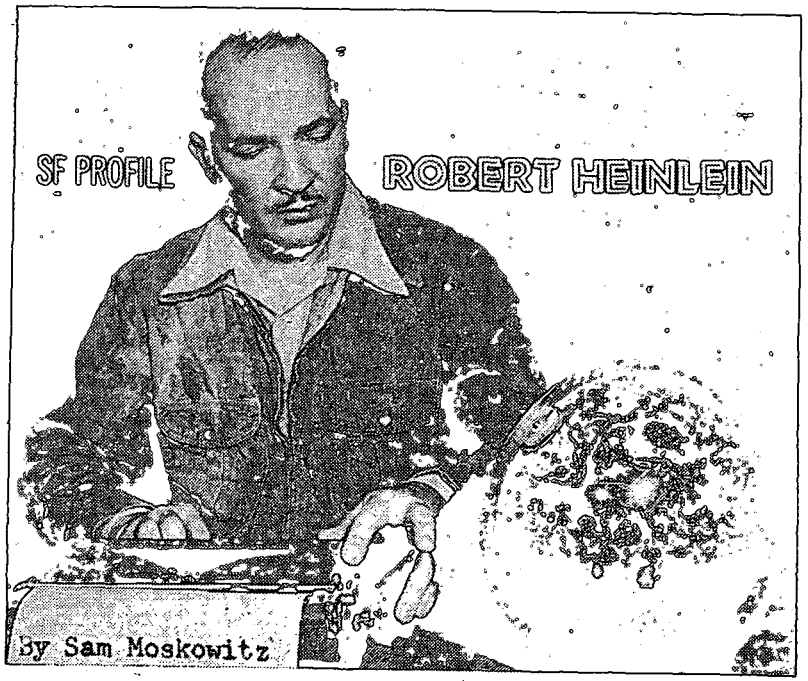

ON Oct. 23, 1960, an event of special significance in the literary acceptance of science fiction occurred. A weekly book review program on a New York City radio station carried a half-hour panel discussion on a book on interstellar warfare by Robert A. Heinlein titled *Starship Troopers*. The panelists were all high school students and the moderator was a college professor.

Considering that mankind is about to enter what is romantically called "The Space Age," it seemed entirely in order that an educational program, customarily devoted to discussions by teenagers of important or timely books, should appraise the world of the future, space exploration and exciting adventure; except those subjects weren't what the panelists were talking about.

A listener tuning in midway during the program might understandably have thought that the topic was "The Philosophy of Government." For the students were evaluating Heinlein's proposal, in his book, of the professional soldier as a basis for government. This idea, in turn, re-

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volved around the premise that citizens should be made to earn the right to vote by serving their country for two years in the armed services. Some way would be found for everyone who volunteered to serve, no matter how disabled. Heinlein projected the thesis that since the armed forces taught by discipline that the individual should place the group above self, a citizen would tend to display that same selflessness in his voting decisions, to the betterment of all.

Beyond that, Heinlein urged that we dispense with romanticism and base our morality upon the fact that we are fundamentally "wild beasts" driven by the need for survival. The morality of the lion, by its very nature, must differ from that of sheep. It cannot be immoral for the lion to kill for food or he would starve.

Something new was happening here. For years, it was the vogue to show what the mainstream writers, who had worked in science fiction, had contributed to the art as it is practiced today. Now, a product of the science fiction pulp magazines, Robert A. Heinlein, by his unique talents, was influencing the thinking of the mainstream.

True, in this case it was on the teenage level; but a few years earlier, through his stories of science fiction in THE SATURDAY EVENING POST and the motion picture based on one of his works, *Destination Moon*, he had demonstrated to adults that the themes of science fiction were their problems in a world only as far away as tomorrow.

Among the writers and devotees of science fiction, Heinlein frequently was envied and adulated for having scaled the top rung in ability and influence among writers of "modern" science fiction ("modern" being used as a term to designate those writers and methods in science fiction that had reached their greatest vogue since 1940). This same inner circle now presented a paradox. In dozens of sf fan magazines, and on the platforms of science fiction conventions, the controversy raged as to whether Heinlein's philosophy in *Starship Troopers* was "evil," valid or merely an author's device to spur reader interest. The majority seemed to regard the philosophy of *Starship Troopers* as Heinlein's personal belief. The majority also condemned it.

On the other hand, despite the furious disputes, science-fictioneers joined ranks on the question of Heinlein's literary artistry. In a poll of readers for the best science fiction novel of 1959, *Starship Troopers* obtained a decisive plurality and its author, for the second time in his writ-

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ing career, received the coveted "Hugo" (science fiction's version of Hollywood's "Oscar") at the 18th World Science Fiction Convention held in Sept., 1960. Four years earlier, at the 1956 convention, Robert Heinlein's novel *Double Star* also copped a Hugo.

But Heinlein, it must be remembered, has for 21 years held major status as a science fiction writer. His views were frequently berated, but as a major shaper of the direction of science fiction, he was also beloved. The two Hugos, in a very real sense, were given him, like the coveted Nobel Prize, in consideration of past as well as current performance. How did Heinlein become such a controversial personality?

ROBERT Anson Heinlein was born July 7, 1907, in Butler, Mo., the son of Rex Ivar Heinlein and Bam Lyle Heinlein. He was one of seven children. And there were distinct checks and balances on his ego as a result of the type of discipline that siblings impose on one another.

He graduated from the public schools of Kansas City, Mo., in 1924. A major if not pivotal influence on his thinking was his subsequent naval career. Heinlein graduated from the U.S. Naval Academy in 1929, and served on aircraft carriers when they were still "science fiction" so far as proving themselves in actual combat was concerned. A crack gunnery officer, he ignored a severe illness while on active duty in 1934 and ended the tour of duty with his health so undermined that he was retired that year as permanently disabled.

The second most important influence on Heinlein's writing was his continuous and generous reading of science fiction from his earliest days, starting with second-hand copies of FRANK READE WEEKLY, a "dime-novel" paper devoted to a young inventor similar to Tom Swift, as well as Tom Swift himself and everything purchasable from the stands from 1916 on. To a "classic" background in Wells, Verne, Haggard and Burroughs, he added regular purchase of ARGOSY-ALL STORY and Hugo Gernsback's ELECTRICAL EXPERIMENTER.

With the appearance of science fiction magazines he bought and read them all. He was literally saturated in the popular periodical background of American science fiction. This broad knowledge of his medium was later reflected in the familiarity with which he combined and refined the diverse and intricate themes of magazine science fiction into his own work.

Heinlein did not have to surmise when he struck a new chord in science fiction. He knew. Echoes of dozens of popular pulp science fiction writers sounded

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in his work, but no single note called his direction. His role was to lead, not to follow.

The only mainstream writer to whom Heinlein acknowledges a debt is Sinclair Lewis, and it is not for literary style. Lewis laid out extensive backgrounds for his work which did not directly appear in the story. That way he understood how his characters should react in a given situation, being possessed of more information on them than the reader. In Heinlein, this ultimately grew beyond the bounds intended by Sinclair Lewis, whose characters performed against a setting that the reader knew. The Sinclair Lewis method couldn't work for science fiction unless an entire history of the future was projected; then, individual stories and characters in that series could at least be consistent with the framework of that never-never land.

In following just this procedure, Robert A. Heinlein inadvertently struck upon the formula that had proved so successful for Edgar Rice Burroughs, L. Frank Baum and, more recently, J. R. R. Tolkien. He created a reasonably consistent dream world and permitted the reader to enter it. Heinlein's Future History has, of course, a stronger scientific base than Burroughs' Mars, Baum's Oz or Tolkien's land of the "Rings." But it is fundamentally the same device.

A retired naval officer at 27, disabled or not, Heinlein could not simply sit and vegetate, so he enrolled at U.C.L.A. graduate school in California to study mathematics and physics. His health failed again before he could complete his studies, but the time spent there gave him an insight into the sciences which were to give his literary work an added note of verisimilitude.

IN the next few years he tried his hand at many things; politics, real estate, architecture and mining; regardless of his personal success at any of them, elements of each seem reflected in his stories. We find Heinlein speaking with a note of authority on the nature of politics in *"If This Goes On . . ."*; the art of selling real estate and architecture both figure in *". . . And He Built A Crooked House"*; only mining seems conspicuously absent from his works.

Personally, evidences of the politician, of the south-western cultured variety, still manifest themselves in the urbanity of Heinlein's manner and his diplomacy in choice of words.

John W. Campbell, Jr., editor of ASTOUNDING SCIENCE FICTION, used to say that the best way to get Heinlein writing was to in-

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terest him in something that cost money. The year that Robert Heinlein first appeared as a professional writer was a depression year, 1939. He needed money to pay the mortgage on his home. Carefully nursing his delicate health, it was scarcely remarkable that he decided to investigate writing as a method of making money. As an unrepentent life-long reader of science fiction, it was a logical step for him to write in that vein.

In 1939 science fiction was booming. An expanding field was good for the beginning writer and editors were anxious to encourage them. Heinlein's first story, LIFE LINE, after an unsuccessful try at COLLIERS, was bought by ASTOUNDING SCIENCE FICTION. It would be nice to say that Heinlein "wowed" them from the first (just as Stanley G. Weimbaum exploded like a nova five years earlier with *A Martian Odyssey*) but it didn't happen that way. *Life Line*, though well written, was only on the borderline of acceptability. It was science-fiction only by courtesy. It concerned Dr. Hugo Pinero, who builds a machine that can tell how long a man will live. The machine functions on the premise that the future, present and past exist simultaneously; that time is a dimension and therefore one's duration in that dimension may be electrically measured. The punch line comes with the realization that the inventor has calculated his own time of death and philosophically accepted it.

There were also a few reader distractions. The previous issue of ASTOUNDING SCIENCE FICTION had featured a new "find" named A. E. van Vogt with a dynamite first story that followed the one Heinlein appeared in titled *Black Destroyer*. The issue featured a decidedly adroit first story, *Ether Breather*, by another capable young man named Theodore Sturgeon.

The competition wasn't asleep either. Around the same time other magazines published the first stories of Alfred Bester and Isaac Asimov.

Misfit, Heinlein's second published story in the November, 1939, ASTOUNDING SCIENCE FICTION, has been given short shrift by reviewers as a minor effort imperfectly told. This is true so far as its intrinsic merit is concerned, but with the advantage of hindsight it can be seen as of paramount importance as a precursor of Heinlein's method. The plot concerns a group of maladjusted boys who are taken to an asteroid by the government for reorientation. Among them is a youth from the Ozarks who develops into a mathematical genius, capable of matching an elec-

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tronic computer without pen or paper. The boy, oddly named Andrew Jackson Libby, saves the ship when the calculator fails and he accurately functions in its stead.

Misfit is Heinlein's first juvenile. It fits the pattern of the juveniles of Heinlein's post-World War II writing career. There is the teenage hero, the firm but fundamentally benevolent military, an elementary skeleton of a plot (misfit boy proves himself) set against a casually detailed background developed as though it could happen today. The gifted boy later becomes an important factor in Heinlein's novel *Methuselah's Children*, helping to perfect a near-the-speed-of-light drive for a star ship.

HEINLEIN came into his own after a very brief apprenticeship with the short story *Requiem* in the Jan., 1940 ASTOUNDING SCIENCE FICTION. D. D. Harriman, hero of that story, is an old man with a bad heart, whose drive, ingenuity and capital made the first manned space flight to the moon possible. He can never go to the moon himself, because the acceleration and other rigors of space travel will kill him. Nevertheless, he convinces two hard-up spacemen to take him. Evading all attempts by associates and government officials to stop him, he survives the trip and lives long enough to actually touch the moon's surface.

Here the student of writing techniques becomes aware of the calibre of Heinlein's craftsmanship. The phrase "art that conceals art" applies pointedly to *Requiem*, as it does to a large number of Heinlein's stories. The reader is not aware that there is a "style." Everything is subordinated to the story which is carried along almost invisibly by clear prose, natural dialogue and a careful integration of detail concerning the times, society and past of the characters that never disturbs the flow of the narrative. This extraordinary talent is at once Heinlein's triumph and sorrow. It can achieve memorable poignancy as in the case of *Requiem*, yet no one ever refers to his prose as poetic, because the details are incorporated with such cool efficiency that few realize the author has sacrificed the aesthetics of the individual passage to achieve the unified poetry of the whole.

Requiem is unusual in still another respect. It is a sequel to a longer story that was not written until 10 years later! The trials and tribulations of Harriman in financing and launching the first moon rocket, referred to in *Requiem*, are delineated in 30,000 excellent words in *The*

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Man Who Sold The Moon, the title story in the first hard-cover collection of Heinlein's Future History series published by Shasta Publishers, in 1950.

In the issue in which *Requiem* was published, editor Campbell went quietly mad about two novels that were forthcoming. The first was by Heinlein, titled *"If This Goes On . . ."* The second was "Final Blackout," by the brilliant pulpster, L. Ron Hubbard, who would disappear from the ranks of science fiction some years later to further his dual creations of Dianetics and Scientology. The latter was distinctly the better of the two, powerfully written, prophetically warning, with the lead character magnificently drawn. Yet, Heinlein's effort was destined to have the more far-reaching effect on the pattern of future science fiction.

"If This Goes On . . ." underlined Campbell's new policy of stressing the sociological implications of the changes of the future in preference to advances in technology. It was a return to the old "Utopias" with the difference that this was a "warning" story, a "Utopia in reverse" or "Misutopia."

The patterns of thought-shaping, television spying and studied psychological and physical torture to keep the masses in line and maintain power, all precede George Orwell's *1984,* published nine years later. Not that Heinlein originated the theory of the methods; but there certainly is something to be said for the writer capable of bringing inadequately considered areas of thought under the scrutiny of the reader.

Most important, *"If This Goes On . . ."* showed one method whereby a state-imposed religion could effectively play a role in the future as a cover for tyranny. Magazine science fiction had stayed clear of theocracy but that policy was now to end, opening a rich field of exploration which helped create at least two reputations: Fritz Leiber, Jr.'s, upon the appearance of *Gather, Darkness* (1943), a novel of dictatorship sustained by the scientifically produced "miracles" of a false religion; and Walter M. Miller, Jr.'s, *A Canticle For Leibowitz,* a masterful effort sympathetically portraying how religion revived learning and civilization after atomic catastrophe.

HEINLEIN'S convincingness in many of his works was due to his use of the technique of "taking the future for granted." The characters were familiar with the world they lived in and behaved accordingly; but through their conversation, actions and the story's setting, the

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reader was adroitly filled in on the details, which frequently were more fascinating than the plot. This eliminated the need for the all-too-common device of bringing a man of the past into the future or somehow getting a message back to today's world.

It was *The Roads Must Roll* that convinced readers of ASTOUNDING SCIENCE FICTION for June, 1940, that Heinlein had arrived as an important new writer. Moving roads and walkways had been common fare in science fiction since Jules Verne, but Heinlein was the first to devote an entire story to a nation whose economy was geared to this form of transportation. The plot is simple and unimportant: what happens when the mechanics who operate these conveyor-belt roads strike. The picture outlined by Heinlein of the character of the civilization that would result from this type of transportation is ingeniously constructed.

But not everything Heinlein was writing at the time struck a responsive chord. *Let There Be Light*, probably rejected by ASTOUNDING, found a home in a new magazine, SUPER SCIENCE STORIES for May, 1940, edited by a man later to make his own reputation as a writer, Frederik Pohl. Because he couldn't pay top rates, the story appeared under the pen name of Lyle Monroe, the "Lyle" being the maiden name of Heinlein's mother. The plot deals with an inventor who discovers a new source of power and is blocked from marketing it by big power interests. He defeats them by making his secret available to the entire world at no charge. It was a fairish sort of story, but aroused a predominantly unfavorable reader reaction because the attempt at naturalism through the use of slang, colloquialisms and sex implications was misinterpreted.

With the publicity attending *"If This Goes On . . ."*, a sequel was not long in coming. *Coventry* appeared in ASTOUNDING for July, 1940, and dealt with the period after the Second American Revolution, when a special area, surrounded by an impassable electronic barrier, was set up for people who did not conform to the current society. They had absolute "freedom" as long as they stayed there and could leave at any time they decided they didn't like it. The story shed new light on Heinlein's own thinking.

Once again we have the recurrent motif of the misfit, a major or minor plot device in a substantial portion of Heinlein's work. Not only is Heinlein obsessed with misfits, but in a surprising number of cases these characters are inherently noble and have a major contribution to make society. Frequently they are far superior to normal man.

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In *Misfit*, the youth taken for reorientation is a mathematical genius; the malcontents of *"If This Goes On . . ."* are the revolutionaries who will restore freedom to America; rebellious Venusian workers in *Logic Of Empire* form a community in every way more desirable than the rest of the planet; outcast "Muties" in *Universe*, despite their grotesqueness, possess the clarity of mind to lead man to the promised land; in *Methuselah's Children* persecuted "Families" are a race of inherently longlived humans; *Waldo's* protagonist must live apart from the human race, subsisting on brilliant invention; Thorby, a slave boy in *Citizen of the Galaxy*, develops to be heir of a great family business empire; and in many of Heinlein's juveniles we find emigrant families from earth, who can't make it on the home planet, ending up as courageous and fulfilled pioneers.

A VERY definite link to Heinlein's thinking is provided by Fader, a prime "misfit in *Coventry*, who really is a disguised military officer on a mission. Forced to sever active duty with the armed services, Heinlein himself, remember, tried a variety of occupations, none of them permanent until he became a writer. A man with his sensitivity must have felt like a right hand being forced into a left-hand glove. Unable to use his military training effectively, it was easy for him to develop an empathy for others he met who were floundering or miscast.

Moreover, a large percentage of Heinlein's misfits are eventually integrated into society, often through the aid of the military or through the adoption of military-like philosophies. Somehow, Heinlein has overlooked the fact that successful authors are not misfits in modern society. They may be different but they *are* accepted, frequently in a sickeningly lavish fashion. He is still not aware that he no longer needs vicariously to justify himself.

Heinlein's *Blowups Happen*, a novelet built around the tension of operating an atomic energy plant, seems more grimly prophetic in hindsight than it actually was when it appeared in ASTOUNDING for Sept., 1940, considering that Campbell had been editorially pounding away at the proximity of atomic energy since 1938. Nevertheless, the story was effective when published, despite the conclusion that no atomic energy plant could safely be operated on the earth's surface and the future would find it necessary to throw them into orbit as earth satellites. (This belief is said to have been held by Campbell during the period the story was published, and it is quite

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possible it may have been a compromise to satisfy him.) More positively, *Blowups Happen* was a model for possibly the best story of that type written to date —*Nerves* by Lester Del Rey, which initially appeared in ASTOUNDING for Sept., 1942.

Meanwhile as a result of the new popularity of science fiction and fantasy, Street and Smith had issued a companion to ASTOUNDING titled UNKNOWN. Stories in UNKNOWN were fairy tales for grownups. Old myths, legends and superstitions were utilized as the background for tales told in a modern manner with today's attitudes and slang, along with a sampling of stories that were too fantastically off-trail to appear anywhere else. Heinlein tried his hand at a bit of good-natured buffoonery titled *The Devil Makes The Law*, about an America where spells and incantations are part of everyday business, for the Sept., 1940, UNKNOWN; but despite a straight-faced effort it didn't quite come off.

Heinlein was so prolific now that it was essential he adopt a pen name in order to be able to run more than one story of his in an issue of ASTOUNDING. Editor Campbell, of Scotch descent, had a deep pride in his blood line. Two of his own pen names were Don A. Stuart and Arthur McCann. Because of this predilection, Campbell took Heinlein's middle name "Anson" and made him a member of the clan as Anson MacDonald.

THE first story under that name, a novel titled *Sixth Column*, ran for three installments beginning in the Jan., 1941, issue. The plot outline was originally the basis of an unpublished novelet of Campbell's, and dealt with an America conquered by Orientals, with a new religion as a front for a revolutionary movement. The foundation of the United States' hopes is the invention of a device which can be set to discriminatingly kill Orientals while leaving other races untouched. The appearance of a scientifically induced 1000-foot tall high black giant, dressed in the robes of the priesthood, is reminiscent of Campbell's *Cloak of Aeser*. Again, as in a large number of Heinlein stories, it is the military man who saves the day. Whatever Heinlein's other early impressions, his years as an officer in the navy must have been most pleasant and psychologically rewarding, for he looks back at them with a reverence and nostalgia akin to religion.

The prose of *Sixth Column* was immaculate, and the story well paced. The Anson MacDonald pen name was one of the poorest-kept secrets in science fiction. Too many people knew it.

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Yet, among the general readers, it must have understandably seemed that an important new talent had appeared on the science fiction horizon.

Outside the one month's temporary employment, Heinlein was now devoting full time to science fiction writing, and there was no question that he had hit his stride. ". . . *And He Built A Crooked House,*" published in ASTOUNDING for Feb., 1941, was a delightful fantasy and the first of his works to be anthologized (*The Pocket Book of Science Fiction,* 1932). An eight-sided house built in the form of a tesseract is shaken up in a California earthquake and its prospective buyers find that it has cut catty-corner across the fourth dimension. Each side looks out on a different landscape and investigation of the paradox was memorable enough to inspire Harry Walton to try to solve a post-war problem that way in *Housing Shortage* (ASTOUNDING, Jan., 1947), a classic in its own right.

Logic of Empire (ASTOUNDING, Mar., 1941) was an extremely well-done exposition on the possibility of a form of slavery reappearing in colonizing the planets (this theme is dealt with in considerable more detail in *Citizen of the Galaxy,* 1957). Here, a Heinlein weakness for hastily tying up the endings of his stories is particularly apparent. It is as though the exploration of the idea is all that interests him, and its culmination proves a burdensome chore to be dispensed with as expediently as possible. With this story a footnote appeared to the effect that Heinlein's "stories are based on a common proposed history of the world, with emphasis on the history of America."

Readers were enthralled by an editorial, *History To Come,* in the May, 1941 ASTOUNDING, calling attention to a two-page chart outlining Heinlein's Future History from 1940 to 2140, with published as well as proposed stories fitted into the framework. Interest in his work mounted tremendously as a result, aided by the appearance of one of his most inspired efforts, *Universe,* in the same issue. The central idea of this story—mammoth ship, a small world in itself, traveling towards the stars in a voyage that will take centuries—was first successfully used by Laurence Manning in *The Living Galaxy* (WONDER STORIES, 1934). But it was Heinlein whose example started a trend. His exposition of a human "crew" who had forgotten, through the centuries of traveling, the original purpose of their journey; of the formation of a religion to explain their strange, limited "universe," was brilliant. A revolt

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and division of the ship into two camps, one largely composed of bizarre mutations as the result of radiation, offers elements of conflict. Excellent action and characterization set against one of the most unusual backgrounds in the history of science fiction up to that time made the story a classic, and the ancestor of many other outstanding efforts of that type including *Far Centaurus* by A. E. van Vogt, *The Voyage That Lasted 600 Years* by Don Wilcox, *One in Three Thousand* by J. T. McIntosh, and *Space-bred Generations* by Clifford D. Simak.

The same issue had Anson MacDonald with *Solution Unsatisfactory*, which, though now dated, was Heinlein's most prophetic effort. In it he predicted, before the entry of the United States in the war, that we would develop atomic energy and produce a weapon from which there was "no place to hide." Heinlein envisioned radioactive dust, rather than a bomb, and was unable to offer any satisfactory solution for policing the discovery. Hence the title.

HEINLEIN began to gather the threads of his future history together in one of the unifying "masterworks" of the series, *Methuselah's Children*, a three-part novel which began in ASTOUNDING for July, 1941. The powerful opening chapter is indebted to A. E. van Vogt's *Slan*, an epic published less than a year previously, concerning the persecution of a mind-reading race of supermen called "slans" by normal humans. In *Methuselah's Children*, there are a widening group of "families" that have been inbreeding with individuals of exceptionally long life-span until heredity has greatly increased their life expectancy. When the normal humans find out about this part of the population a tremendous wave of persecution proceeds, aimed at extracting the "secret."

To save themselves, the "families" hi-jack an interstellar ship and start out on their own journey to the stars. Landing on a world of about earth's level of development, they leave in haste when they discover the "gods" these people worship are the true owners of the planet, and far beyond the earthmen in mental power. The story almost becomes fantasy when they alight on a second world, whose friendly inhabitants can by thought impulses change the fruit of trees to taste like steak and potatoes, or to an ice cream soda, or to whatever the earthmen prefer. The protagonists leave to return to earth when they find these creatures have a community mind that some of their party are joining! References to char-

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acters met in previous Heinlein stories are frequent, and the effect is like a joyous old home week with the abundance of ideas combining into an intoxicating "sense-of-wonder" party.

To many, Heinlein achieved the pinnacle in the Oct., 1941, issue of ASTOUNDING featuring *By His Bootstraps*. Without question this is one of the greatest time-travel paradox stories of all time. A man comes back from the future to meet himself, fights himself, while himself stands by and watches. The effect is like examining a Moebius strip or a Klein bottle from the other side. Of course the story is a trick; but it virtually takes mathematics to disprove it, and Heinlein doesn't forget to tell a good tale in the process.

It was enough. Heinlein had made his point. Nineteen months after the appearance of his first story in Aug., 1939, a nationwide poll of science fiction fans rated Robert A. Heinlein as the most popular author!

Nine months earlier—in July, 1941—almost as if in rehearsal for the event, Heinlein had been guest of honor of the Third Annual World Science Fiction Convention in Denver, Colo. He said then: "I think that science fiction, even the corniest of it, even the most outlandish of it, no matter how badly it's written, has a distinct therapeutic value because *all* of it has as its primary postulate that the world *does* change."

A DYED-IN-THE-WOOL military man, Heinlein found a way to serve his country after Pearl Harbor, Dec. 7, 1941. As a mechanical engineer he put in long hours on highly secret radar and anti-kamikaze device. When he entered the service, science fiction lost three major authors: Robert A. Heinlein, Anson MacDonald and Lyle Monroe. Two other pseudonyms, Caleb Saunders and John Riverside, had published a single story apiece when the call came.

The most heralded "last" story of this first phase of Heinlein's writing was *Waldo*, which appeared under the MacDonald name in ASTOUNDING for Aug., 1942. Depicted on the cover was a remote-control device for manually handling objects, since built and utilized for manipulating radio-active materials in atomic energy plants and which actually are called "waldoes" in acknowledgement of the story that conceived them. This precise scientific prediction was one of a number in a wildly imaginative story with two precious characters: Waldo, a fat boy, born with a muscular weakness that made it possible for him to function properly only in the weightlessness of an earth satellite, and

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who is forced for his own survival to become a supreme mechanical genius; and the ancient Amish-Country hex doctor, Schneider, who seems to be able to make metaphysics work under certain circumstances.

For almost a year after the end of World War II nothing appeared by Robert A. Heinlein. Then with the unexpectedness of a thunderclap, *The Green Hills Of Earth*, a story in the "Future History" series appeared in THE SATURDAY EVENING POST. It was followed by *Space Jockey*, *It's Great To Be Back* and *The Black Pits of Luna*. With the exception of *It's Great To Be Back*, a minor masterpiece in the adjustment of long-term residents on the moon to the heavier gravitational pull of the earth, they were virtually school-book primer science fiction in flawless slick prose. No one realized it at the time, but a unique thing had happened. The science fiction magazines had sent a missionary to the masses. Their top writer, Robert A. Heinlein, had unwittingly begun to educate the general public to science fiction, beginning with its most elementary forms.

Because of his popularity in the science fiction field, and his surehanded success with a wider audience, Heinlein became the most imitated figure in science fiction. Authors by the dozen copied his matter-of-fact style, placing major emphasis on the turn of the phrase. They seemed unaware of the flavor and substance contained in the background of Heinlein's stories. They were unable or unwilling to duplicate it. Heinlein was casual, but he did not lack a sense of wonder. He was merely more sophisticated about the manner in which he introduced it. His readers were not cheated of the one thing that science fiction has to sell. What effectiveness would *The Roads Must Roll* have had without the carefully constructed picture of a society dependent on conveyors?

This "sense of wonder" was defined by Rollo May in his book, *Man's Search For Himself*: "Wonder is the opposite of cynicism and boredom; it indicates that a person has a heightened aliveness, is interested, expectant, responsive. It is essentially an 'opening' attitude . . . an awareness that there is more to life than one has yet fathomed, an experience of new vistas in life to be explored as well as new profundities to be plumbed."

The newcomers and the imitators trying to emulate Heinlein misinterpreted style for substance, sliding their papier-maché characters down well-grooved situations, past improvised props, for an overall effect as unreal as a puppet show. There

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were a great many of these imitators and they crowded the pages of the magazines. One by one they—and the magazines—disappeared.

Heinlein's legacy to his own field was therefore tragic. Through no fault of his own, he played the role of a literary Pied Piper in the decline of science fiction that continued through the decade of the 1950's. One of his stories, published in 1941, was called *Lost Legions*. It should have been dedicated to his imitators.

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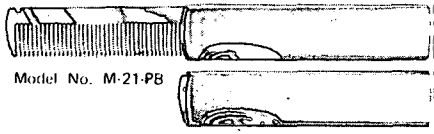

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Keith Laumer is a writer new to science fiction. In this story he displays the finesse, artistry and imagination of an old pro. Here is one of the tightest, tautest stories of interplanetary adventure in a long while:

GREYLORN

By KEITH LAUMER

PROLOGUE

THE murmur of conversation around the conference table died as the World Secretary entered the room and took his place at the head of the table.

"Ladies and Gentlemen," he said. "I'll not detain you with formalities today. The representative of the Navy Department is waiting outside to present the case for his proposal. You all know something of the scheme; it has been heard and passed as feasible by the Advisory Group. It will now be our responsibility to make the decision. I ask that each of you in forming a conclusion remember that our present situation can only be described as desperate, and that desperate measures may be in order."

The Secretary turned and nodded to a braided admiral seated near the door who left the room and returned a moment later with a young gray-haired Naval Officer.

"Members of the Council," said the admiral, "this is Lieutenant Commander Greylorn." All eyes followed the officer as he walked the length of the room to take the empty seat at the end of the table.

"Please proceed, Commander," said the Secretary.

"Thank you, Mr. Secretary." The Commander's voice was unhurried and low, yet it carried clearly and held authority. He began without preliminary.

"When the World Government dispatched the Scouting Forces forty-three years ago, an effort was made to contact each of the twenty-five worlds to which this government had sent Colonization parties during the Colonial

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Era of the middle Twentieth Centuries. With the return of the last of the scouts early this year, we were forced to realize that no assistance would be forthcoming from that source."

The Commander turned his eyes to the world map covering the wall. With the exception of North America and a narrow strip of coastal waters, the entire map was tinted an unhealthy pink.

"The latest figures compiled by the Department of the Navy indicate that we are losing area at the rate of one square mile every twenty-one hours. The organism's faculty for developing resistance to our chemical and biological measures appears to be evolving rapidly. Analyses of atmospheric samples indicate the level of noxious content rising at a steady rate. In other words, in spite of our best efforts, we are not holding our own against the Red Tide."

A mutter ran around the table, as Members shifted uncomfortably in their seats.

"A great deal of thought has been applied to the problem of increasing our offensive ability. This in the end is still a question of manpower and raw resources. We do not have enough. Our small improvements in effectiveness have been progressively offset by increasing casualties and loss of territory. In the end, alone, we must lose."

The Commander paused, as the murmur rose and died again. "There is however, one possibility still unexplored," he said. "And recent work done at the Polar Research Station places the possibility well within the scope of feasibility. At the time the attempt was made to establish contact with the colonies, one was omitted. It alone now remains to be sought out. I refer to the Omega Colony."

A portly Member leaned forward and burst out, "The location of the colony is unknown!"

The Secretary intervened. "Please permit the Commander to complete his remarks. There will be ample opportunity for discussion when he has finished."

"This contact was not attempted for two reasons," the Commander continued. "First, the precise location was not known; second, the distance was at least twice that of the earlier colonies. At the time, there was a feeling of optimism which seemed to make the attempt superfluous. Now the situation has changed. The possibility of contacting Omega Colony now assumes paramount importance.

"The development of which I spoke is a new application of drive principle which has given to us a greatly improved effective velocity for space propulsion. Forty years ago, the minimum elapsed time of return travel to the presumed sector within which the Omega World should lie was about a century. Today we have the techniques to construct a small scouting vessel capable of making the transit in

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just over five years. We cannot hold out here for a century, perhaps; but we can manage a decade.

"As for location, we know the initial target point toward which Omega was launched. The plan was of course that a precise target should be selected by the crew after approaching the star group closely enough to permit telescopic planetary resolution and study. There is no reason why the crew of a scout could not make the same study and examination of possible targets, and with luck find the colony.

"Omega was the last colonial venture undertaken by our people, two centuries after the others. It was the best equipped and largest expedition of them all. It was not limited to one destination, little known, but had a presumably large selection of potentials from which to choose; and her planetary study facilities were extremely advanced. I have full confidence that Omega made a successful planetfall and has by now established a vigorous new society.

"Honorable Members of the Council, I submit that all the resources of this Government should be at once placed at the disposal of a task force with the assigned duty of constructing a fifty-thousand-ton scouting vessel, and conducting an exhaustive survey of a volume of space of one thousand A.U.'s centered on the so-called Omega Cluster."

The World Secretary interrupted the babble which arose with the completion of the officer's presentation.

"Ladies and gentlemen, time is of the essence of our problem. Let's proceed at once to orderly interrogation. Mr. Klayle, lead off, please."

The portly Councillor glared at the Commander. "The undertaking you propose, sir, will require a massive diversion of our capacities from defense. That means losing ground at an increasing rate to the obscenity crawling over our planet. That same potential applied to direct offensive measures may yet turn the balance in our favor. Against this, the possibility of a scouting party stumbling over the remains of a colony the location of which is almost completely problematical, and which by analogy with all of the earlier colonial attempts has at best managed to survive as a marginal foothold, is so fantastically remote as to be inconsiderable."

The Commander listened coolly, seriously. "Mr. Councillor," he replied, "as to our defensive measures, we have passed the point of diminishing returns. We have more knowledge now than we are capable of employing against the plague. Had we not neglected the physical sciences as we have for the last two centuries, we might have developed adequate measures before we had been so far reduced in numbers and area as to be unable to produce and employ the new weapons our laboratories have

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belatedly developed. Now we must be realistic; there is no hope in that direction.

"As to the location of the Omega World, our plan is based on the fact that the selection was not made at random. Our scout will proceed along the Omega course line as known to us from the observations which were carried on for almost three years after its departure. We propose to continue on that line, carrying out systematic observation of each potential sun in turn. As we detect planets, we will alter course only as necessary to satisfy ourselves as to the possibility of suitability of the planet. We can safely assume that Omega will not have bypassed any likely target. If we should have more than one prospect under consideration at any time, we shall examine them in turn. If the Omega World has developed successfully, ample evidence should be discernible at a distance."

Klayle muttered "Madness," and subsided. The angular member on his left spoke gently, "Mr. Greylorn, why, if this colonial venture has met with the success you assume, has its government not reestablished contact with the mother world during the last two centuries?"

"On that score, Mr. Councillor, we can only conjecture," the Commander said. "The outward voyage may have required as much as fifty or sixty years. After that, there must have followed a lengthy period of development and expansion in building the new world. It is not to be expected that the pioneers would be ready to expend resources in expeditionary ventures for some time."

"I do not completely understand your apparent confidence in the ability of the hypothetical Omega culture to supply massive aid to us, even if its people should be so inclined," said a straight-backed woman member. "The time seems very short for the mastery of an alien world."

"The population development plan, Madam, provided for an increase from the original 10,000 colonists to approximately 40,000 within twenty years, after which the rate of increase would of course rapidly grow. Assuming sixty years for planetfall, the population should now number over one hundred sixty millions. Given population, all else follows."

Two hours later, the World Secretary summed up. "Ladies and gentlemen, we have the facts before us. There still exist differences in interpretation, which however will not be resolved by continued repetition. I now call for a vote on the resolution proposed by the Military Member and presented by Commander Greylorn."

There was silence in the Council Chamber as the votes were recorded and tabulated. Then the World Secretary sighed softly.

"Commander," he said, "the

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Council has approved the resolution. I'm sure that there will be general agreement that you will be placed at the head of the project, since you were director of the team which developed the new drive and are also the author of the plan. I wish you the best of luck." He rose and extended his hand.

The first keel plate of the Armed Courier Vessel *Galahad* was laid thirty-two hours later.

CHAPTER 1

I EXPECTED trouble when I left the bridge. The tension that had been building for many weeks was ready for release in violence. The ship was silent as I moved along the passageway. Oddly silent, I thought; something was brewing.

I stopped before the door of my cabin, listening; then I put my ear to the wall. I caught the faintest of sounds from within; a muffled click, voices. Someone was inside, someone attempting to be very quiet. I was not overly surprised. Sooner or later the trouble had had to come into the open. I looked up the passage, dim in the green glow of the nightlights. There was no one in sight.

I listened. There were three voices, too faint to identify. The clever thing for me to do now would be to walk back up to the bridge, and order the Provost Marshall to clear my cabin, but I had an intuitive feeling that that was not the way to handle the situation. It would make things much simpler all around if I could push through this with as little commotion as possible.

There was no point in waiting. I took out my key and placed it soundlessly in the slot. As the door slid back I stepped briskly into the room. Kramer, the Medical Officer, and Joyce, Assistant Communications Officer, stood awkwardly, surprised. Fine, the Supply Officer, was sprawled on my bunk. He sat up quickly.

They were a choice selection. Two of them were wearing sidearms. I wondered if they were ready to use them, or if they knew just how far they were prepared to go. My task would be to keep them from finding out.

I avoided looking surprised. "Good evening, gentlemen," I said cheerfully. I stepped to the liquor cabinet, opened it, poured Scotch into a glass. "Join me in a drink?" I said.

None of them answered. I sat down. I had to move just a little faster than they did, and by holding the initiative, keep them off balance. They had counted on hearing my approach, having a few moments to get set, and using my surprise against me. I had reversed their play and taken the advantage. How long I could keep it depended on how well I played my few cards. I plunged ahead, as I saw Kramer take a breath and wrinkle his brow, about to make his pitch.

"The men need a change, a break in the monotony," I said.

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"I've been considering a number of possibilities." I fixed my eyes on Fine as I talked. He sat stiffly on the edge of my bunk. Already he was regretting his boldness in presuming to rumple the Captain's bed.

"It might be a good bit of drill to set up a few live missile runs on random targets," I said. "There's also the possibility of setting up a small arms range and qualifying all hands." I switched my eyes to Kramer. Fine was sorry he'd come, and Joyce wouldn't take the initiative; Kramer was my problem. "I see you have your Mark 9, Major," I said, holding out my hand. "May I see it?" I smiled pleasantly.

I hoped I had hit him quickly and smoothly enough, before he had had time to adjust to the situation. Even for a hard operator like Kramer, it took mental preparation to openly defy his Commander, particularly in casual conversation. But possession of the weapon was more than casual. . . .

I looked at him, smiling, my hand held out. He wasn't ready; he pulled the pistol from its case, handed it to me.

I flipped the chamber open, glanced at the charge indicator, checked the action. "Nice weapon," I said. I laid it on the open bar at my right.

Joyce opened his mouth to speak. I cut in in the same firm snappy tone I use on the bridge. "Let me see yours, Lieutenant."

He flushed, looked at Kramer, then passed the pistol over without a word. I took it, turned it over thoughtfully, and then rose, holding it negligently by the grip.

"Now, if you gentlemen don't mind, I have a few things to attend to." I was not smiling. I looked at Kramer with expressionless eyes. "I think we'd better keep our little chat confidential for the present. I think I can promise you action in the near future, though."

They filed out, looking as foolish as three preachers caught in a raid on a brothel. I stood without moving until the door closed. Then I let my breath out. I sat down and finished off the Scotch in one drag.

"You were lucky, boy," I said aloud. "Three gutless wonders."

I looked at the Mark 9's on the table. A blast from one of those would have burned all four of us in that enclosed room. I dumped them into a drawer and loaded my Browning 2mm. The trouble wasn't over yet, I knew. After this farce, Kramer would have to make another move to regain his prestige. I unlocked the door, and left it slightly ajar. Then I threw the main switch and stretched out on my bunk. I put the Browning needler on the little shelf near my right hand.

Perhaps I had made a mistake, I reflected, in eliminating formal discipline as far as possible in the shipboard routine. It had seemed the best course for a long cruise under the present condi-

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tions. But now I had a morale situation that could explode in mutiny at the first blunder on my part.

I knew that Kramer was the focal point of the trouble. He was my senior staff officer, and carried a great deal of weight in the Officer's Mess. As a medic, he knew most of the crew better than I. I thought I knew Kramer's driving motive, too. He had always been a great success with the women. When he had volunteered for the mission he had doubtless pictured himself as quite a romantic hero, off on a noble but hopeless quest. Now, after four years in deep space, he was beginning to realize that he was getting no younger, and that at best he would have spent a decade of his prime in monastic seclusion. He wanted to go back now, and salvage what he could.

It was incredible to me that this movement could have gathered followers, but I had to face the fact; my crew almost to a man had given up the search before it was well begun. I had heard the first rumors only a few weeks before, but the idea had spread through the crew like wildfire. Now, I couldn't afford drastic action, or risk forcing a blowup by arresting ringleaders. I had to baby the situation along with an easy hand and hope for good news from the Survey Section. A likely find now would save us.

There was still every reason to hope for success in our search. To date all had gone according to plan. We had followed the route of Omega as far as it had been charted, and then gone on, studying the stars ahead for evidence of planets. We had made our first finds early in the fourth year of the voyage. It had been a long tedious time since then of study and observation, eliminating one world after another as too massive, too cold, too close to a blazing primary, too small to hold an atmosphere. In all we had discovered twelve planets, of four suns. Only one had looked good enough for close observation. We had moved in to televideo range before realizing it was an all-sea world.

Now we had five new main-sequence suns ahead within six months' range. I hoped for a confirmation on a planet at any time. To turn back now to a world that had pinned its last hopes on our success was unthinkable, yet this was Kramer's plan, and that of his followers. They would not prevail while I lived. Still it was not my plan to be a party to our failure through martyrdom. I intended to stay alive and carry through to success. I dozed lightly and waited.

I awoke when they tried the door. It had swung open a few inches at the touch of the one who had tried it, not expecting it to be unlatched. It stood ajar now, the pale light from the hall shining on the floor. No one entered. Kramer was still fum-

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bling, unsure of himself. At every surprise with which I presented him, he was paralyzed, expecting a trap. Several minutes passed in tense silence; then the door swung wider.

"I'll be forced to kill the first man who enters this room," I said in a steady voice. I hadn't picked up the gun.

I heard urgent whispers in the hall. Then a hand reached in behind the shelter of the door and flipped the light switch. Nothing happened, since I had opened the main switch. It was only a small discomfiture, but it had the effect of interfering with their plan of action, such as it was. These men were being pushed along by Kramer, without a clearly thought out plan. They hardly knew how to go about defying lawful authority.

I called out, "I suggest you call this nonsense off now, and go back to your quarters, men. I don't know who is involved in this, yet. You can get away clean if you leave quietly, now, before you've made a serious mistake."

I hoped it would work. This little adventure, abortive though it was, might serve to let off steam. The men would have something to talk about for a few precious days. I picked up the needler and waited. If the bluff failed, I would have to kill someone.

Distantly I heard a metallic clatter. Moments later a tremor rattled the objects on the shelf, followed a few seconds later by a heavy shuddering. Papers slid from my desk, fluttered across the floor. The whiskey bottle toppled, rolled to the far wall. I felt dizzy, as my bunk seemed to tilt under me. I reached for the intercom key and flipped it.

"Taylor," I said, "this is the Captain. What's the report?"

There was a momentary delay before the answer came. "Captain, we've taken a meteor strike aft, apparently a metallic body. It must have hit us a tremendous wallop because it's set up a rotation. I've called out Damage Control."

"Good work, Taylor," I said. I keyed for Stores; the object must have hit about there. "This is the Captain," I said. "Any damage there?"

I got a hum of background noise, then a too-close transmission. "Uh, Cap'n, we got a hole in the aft bulkhead here. I slapped a seat pad over it. Man, that coulda killed somebody."

I flipped off the intercom and started aft at a run. My visitors had evaporated. In the passage men stood, milled, called questions. I keyed my mike as I ran. "Taylor, order all hands to emergency stations."

It was difficult running, since the floors had assumed an apparent tilt. Loose gear was rolling and sliding along underfoot, propelled forward by centrifugal force. Aft of Stores, I heard the whistle of escaping air and high pressure gasses from ruptured lines. Vapor clouds fogged the

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air. I called for floodlights for the whole sector.

Clay appeared out of the fog with his damage control crew. "Sir," he said, "it's punctured inner and outer shells in two places, and fragments have riddled the whole sector. There are at least three men dead, and two hurt."

"Taylor," I called, "let's have another damage control crew back here on the triple. Get the medics back here, too." Clay and his men put on masks and moved off. I borrowed one from a man standing by and followed. The large exit puncture was in the forward cargo lock. The room was sealed off, limiting the air loss.

"Clay," I said, "pass this up for the moment and get that entry puncture sealed. I'll put the extra crew in suits to handle this."

I moved back into clear air and called for reports from all sections. The worst of the damage was in the auxiliary power control room, where communication and power lines were slashed and the panel cut up. The danger of serious damage to essential equipment had been very close, but we had been lucky. This was the first instance I had heard of of encountering an object at hyper light speed.

It was astonishing how this threat to our safety cleared the air. The men went about their duties more cheerfully than they had for months, and Kramer was conspicuous by his subdued air. The emergency had reestablished at least for the time the normal discipline; the men still relied on the Captain in trouble.

Damage control crews worked steadily for the next seventy-two hours, replacing wiring, welding, and testing. Power Section jockeyed endlessly, correcting air motions. Meanwhile, I checked almost hourly with Survey Section, hoping for good news to consolidate the improved morale situation.

It was on Sunday morning, just after dawn relief that Lt. Taylor came up to the bridge looking sick.

"Sir," he said, "we took more damage than we knew with that meteor strike." He stopped and swallowed hard.

"What have you got, Lieutenant?" I said.

"We missed a piece. It must have gone off on a tangent through stores into the cooler. Clipped the collant line, and let warm air in. All the fresh frozen stuff is contaminated and rotten." He gagged. "I got a whiff of it, sir. Excuse me." He rushed away.

This was calamity.

We didn't carry much in the way of fresh natural food; but what we had was vital. It was a bulky, delicate cargo to handle, but the chemists hadn't yet come up with synthetics to fill all the dietary needs of man. We could get by fine for a long time on vitamin tablets and concentrates; but there were nutrition-

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al elements that you couldn't get that way. Hydroponics didn't help; we had to have a few ounces of fresh meat and vegetables grown in sunlight every week, or start to die within months.

I knew that Kramer wouldn't let this chance pass. As Medical Officer he would be well within his rights in calling to my attention the fact that our health would soon begin to suffer. I felt sure he would do so as loudly and publicly as possible at the first opportunity.

My best move was to beat him to the punch by making a general announcement, giving the facts in the best possible light. That might take some of the sting out of anything Kramer said later.

I gave it to them, short and to the point. "Men, we've just suffered a serious loss. All the fresh frozen stores are gone. That doesn't mean we'll be going on short rations; there are plenty of concentrates and vitamins aboard. But it does mean we're going to be suffering from deficiencies in our diet.

"We didn't come out here on a pleasure cruise; we're on a mission that leaves no room for failure. This is just one more fact for us to face. Now let's get on with the job."

I walked into the wardroom, drew a cup of near-coffee, and sat down. The screen showed a beach with booming surf. The sound track picked up the crash and hiss of the breakers. Considering the red plague that now covered the scene, I thought it was a poor choice. I dialed for a high view of rolling farmland.

Mannion sat at a table across the room with Kirschenbaum. They were hunched over their cups, not talking. I wondered where they stood. Mannion, Communications Officer, was neurotic, but an old Armed Force man. Discipline meant a lot to him. Kirschenbaum, Power Chief, was a joker, with cold eyes, and smarter than he seemed. The question was whether he was smart enough to realize the stupidity of retreat now.

Kramer walked in, not wasting any time. He saw me and came over. He stopped a few feet from the table, and said loudly, "Captain, I'd like to know your plans, now that the possibility of continuing is out."

I sipped my near-coffee and looked at the rolling farmland. I didn't answer him. If I could get him mad, I could take him at his game.

Kramer turned red. He didn't like being ignored. The two at the other table were watching.

"Captain," Kramer said loudly. "As Medical Officer I have to know what measures you're taking to protect the health of the men."

This was a little better. He was on the defensive now; explaining why he had a right to question his Commander. I wanted him a little hotter though.

I looked up at him. "Kramer,"

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I said in a clear, not too loud voice, "you're on watch. I don't want to find you hanging around the wardroom making light chit-chat until you're properly relieved from duty." I went back to my near-coffee and the farmland. A river was in view now, and beyond it distant mountains.

Kramer was furious. "Joyce has relieved me, Captain," he said, controlling his voice with an effort. "I felt I'd better take this matter up with you as soon as possible, since it affects the health of every man aboard." He was trying to keep cool, in command of himself.

"I haven't authorized any changes in the duty roster, Major," I said mildly. "Report to your post." I was riding the habit of discipline now, as far as it would carry me. I hoped that disobedience to a direct order, solidly based on regulations, was a little too big a jump for Kramer at the moment. Tomorrow it might be different. But it was essential that I break up the scene he was staging.

He wilted. "I'll see you at 1700 in the chart room, Kramer," I said as he turned away. Mannion and Kireschenbaum looked at each other, then finished their near-coffee hurriedly and left. I hoped their version of the incident would help deflate Kramer's standing among the malcontents.

I left the wardroom and took the lift up to the bridge and checked with Clay and his survey team.

"I think I've spotted a slight perturbation in Delta 3, Captain," Clay said. "I'm not sure, we're still pretty far out."

"All right, Clay," I said. "Stay with it."

Clay was one of my more dependable men, dedicated to his work. Unfortunately, he was no man of action. He would have little influence in a show-down.

I was at the Schmidt when I heard the lift open. I turned; Kramer, Fine, Taylor, and a half a dozen enlisted crew chiefs crowded out, bunched together. They were all wearing needlers. At least they'd learned that much, I thought.

Kramer moved forward. "We feel that the question of the men's welfare has to be dealt with right away, Captain," he said smoothly.

I looked at him coldly, glanced at the rest of his crew. I said nothing.

"What we're faced with is pretty grim, even if we turn back now. I can't be responsible for the results if there's any delay," Kramer said. He spoke in an arrogant tone. I looked them over, let the silence build.

"You're in charge of this menagerie?" I said, looking at Kramer. "If so, you've got thirty seconds to send them back to their kennels. We'll go into the matter of unauthorized personnel on the bridge later. As for you, Major, you can consider yourself under arrest in quarters. Now *Move*."

Kramer was ready to stare me

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down, but Fine gave me a break by tugging at his sleeve. Kramer shook him loose, snarling. At that the crew chiefs faded back into the lift. Fine and Taylor hesitated, then joined them. Kramer started to shout after them, then got hold of himself. The lift moved down.

Kramer thought about going for his needler. I looked at him through narrowed eyes. He decided to rely on his mouth, as usual. He licked his lips. "All right, I'm under arrest," he said. "But as Medical Officer of this vessel it's my duty to remind you that you can't live without a certain minimum of fresh organic food. We've got to start back now." He was pale, but determined. He couldn't bear the thought of getting bald and toothless from dietary deficiency. The girls would never give him another look.

"We're going on, Kramer," I said. "As long as we have a man aboard still able to move. Teeth or no teeth."

"Deficiency disease is no joke, Captain," Kramer said. "You can get all the symptoms of leprosy, cancer and syphillis just by skipping a few necessary elements in your diet. And we're missing most of them."

"Giving me your opinions is one thing, Kramer," I said. "Mutiny is another."

Clay stood beside the main screen, wide-eyed. I couldn't send Kramer down under his guard. "Let's go, Kramer," I said. "I'm locking you up myself."

We rode down in the lift. The men who had been with Kramer stood awkwardly, silent as we stepped out into the passage. I spotted two chronic trouble-makers among them. I thought I might as well call them now as later. "Williams and Nagle," I said, "this officer is under arrest. Escort him to his quarters and lock him in." As they stepped forward hesitantly, Kramer said, "Keep your filthy hooks off me." He started down the passage.

If I could get Kramer put away before anybody else started trouble, I might be able to bluff it through. I followed him and his two sheepish guards down past the power section, and the mess. I hoped there would be no crowd there to see their hero Kramer under guard.

I was out of luck. Apparently word had gone out of Kramer's arrest, and the corridor was clogged with men. They stood unmoving as we approached. Kramer stopped.

"Clear this passage, you men," I said.

Slowly they began to move back, giving ground reluctantly.

Suddenly Kramer shouted. "That's right, you whiners and complainers, clear the way so the Captain can take me back to the missile deck and shoot me. You just want to talk about home; you haven't got the guts to do anything about it."

The moving mass halted, milled. Someone shouted, "Who's he think he is, anyway."

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Kramer whirled toward me. "He thinks he's the man who's going to let you all rot alive, to save his record."

"Williams, Nagle," I said loudly, "clear this passage."

Williams started half-heartedly to shove at the men nearest him. A fist flashed out and snapped his head back. That was a mistake; Williams pulled his needler, and fired a richochet down the passage.

" 'Bout twelve a you yellowbellies git outa my way," he yelled. "I'm comin' through."

Nagle moved close to Williams, and shouted something to him. The noise drowned it. Kra... swung back to me, frantic to regain his sway over the mob.

"Once I'm out of the way, there'll be a general purge," he roared. The hubbub faded, as men turned to hear him.

"You're all marked men. He's gone mad. He won't let one of you live." Kramer had their eyes now. "Take him now," he shouted, and seized my arm to begin the action.

He'd rushed it a little. I hit him across the face with the back of my hand. No one jumped to his assistance. I drew my 2mm. "If you ever lay a hand on your Commanding Officer again, I'll burn you where you stand, Kramer."

Then a voice came from behind me. "You're not killing anybody without a trial, Captain." Joyce stood there with two of the crew chiefs, needler in hand. Fine and Taylor were not in sight.

I pushed Kramer out of my way and walked up to Joyce.

"Hand me that weapon, Junior, butt first," I said. I looked him in the eye with all the glare I had. He stepped back a pace.

"Why don't you jump him," he called to the crowd.

The wall annunciator hummed and spoke.

"Captain Greylorn, please report to the bridge. Unidentified body on main scope."

Every man stopped in his tracks, listening. The annunciator continued. "Looks like it's decelerating, Captain."

I holstered my pistol, pushed past Joyce, and trotted for the lift. The mob behind me broke up, talking, as men under long habit ran for action stations.

Clay was operating calmly under pressure. He sat at the main screen, and studied the blip, making tiny crayon marks.

"She's too far out for a reliable scanner track, Captain," he said, "but I'm pretty sure she's braking."

If that were true, this might be the break we'd been living for. Only manned or controlled bodies decelerated in deep space.

"How did you spot it, Clay?" I asked. Picking up a tiny mass like this was a delicate job, even when you knew its coordinates.

"Just happened to catch my eye, Captain," he said. "I always make a general check every watch of the whole forward quadrant. I noticed a blip where

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I didn't remember seeing one before."

"You have quite an eye, Clay," I said. "How about getting this object in the beam."

"We're trying now, Captain," he said. "That's a mighty small field, though."

Joyce called from the radar board, "I think I'm getting an echo at 15,000, sir. It's pretty weak."

Miller, quiet and meticulous, delicately tuned the beam control. "Give me your fix, Joyce," he said. "I can't find it."

Joyce called out his figures, in seconds of arc to three places.

"You're right on it, Joyce," Miller called a minute later. "I got it. Now pray it don't get away when I boost it."

Clay stepped over behind Miller. "Take it a few mags at a time," he said calmly.

I watched Miller's screen. A tiny point near the center of the screen swelled to a spec, and jumped nearly off the screen to the left. Miller centered it again, and switched to a higher power. This time it jumped less, and resolved into two tiny dots.

Step by step the magnification was increased as ring after ring of the lens antenna was thrown into play. Each time the centering operation was more delicate. The image grew until it filled a quarter of the screen. We stared at it in fascination.

It showed up in stark silhouette, in the electronic "light" of the radar scope. Two perfect discs, joined by a fine filament. As we watched, their relative positions slowly shifted, one moving across, half occluding the other.

As the image drifted, Miller worked with infinite care at his console to hold it on center, in sharp focus.

"Wish you'd give me an orbit on this thing, Joyce," he said, "so I could lock onto it."

"It ain't got no orbit, man," Joyce said. "I'm trackin' it, but I don't understand it. That rock is on a closing curve with us, and slowin' down fast."

"What's the velocity, Joyce?" I asked.

"Averagin' about 1,000 relative, Captain, but slowin' fast."

"All right, we'll hold our course," I said.

I keyed for a general announcement.

"This is the Captain," I said. "General Quarters. Man action stations and prepare for possible contact within one hour."

"Missile Section. Arm No. 1 Battery and stand by."

Then I added, "We don't know what we've got here, but it's not a natural body. Could be anything from a torpedo on up."

I went back to the Beam screen. The image was clear, but without detail. The two discs slowly drew apart, then closed again.

"I'd guess that movement is due to rotation of two spheres around a common center," Clay said.

"I agree with you," I said.

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"Try to get me a reading on the mass of the object."

I wondered whether Kramer had been locked up as I had ordered, but at this moment it seemed unimportant. If this was, as I hoped, a contact with our colony, all our troubles were over.

The object (I hesitated to call it a ship) approached steadily, still decelerating. Now Clay picked it up on the televideo, as it paralleled our course forty-five hundred miles out.

"Captain, it's my guess the body will match speeds with us at about 200 miles, at his present rate of deceleration," Clay said.

"Hold everything you've got on him, and watch closely for anything that might be a missile," I said.

Clay worked steadily over his chart table. Finally he turned to me. "Captain, I get a figure of over a hundred million tons mass; and calibrating the scope images gives us a length of nearly two miles."

I let that sink in. I had a strong and very empty feeling that this ship, if ship it were, was not an envoy from any human colony.

The annunciator hummed and spoke. "Captain, I'm getting a very short wave transmission from a point out on the starboard bow. Does that sound like your torpedo?" It was Mannion.

"That's it, Mannion," I said. "Can you make anything of it?"

"No, sir," he answered. "I'm taping it, so I can go to work on it."

Mannion was our language and code man. I hoped he was good.

"What does it sound like," I asked. "Tune me in."

After a moment a high hum came from the speaker. Through it I could hear harsh chopping consonants, a whining intonation. I doubted that Mannion would be able to make anything of that gargle.

Our Bogie closed steadily. At four hundred twenty-five miles he reversed relative directions, and began matching our speed, moving closer to our course. There was no doubt he planned to parallel us.

I made a brief announcement to all hands describing the status of the action. Clay worked over his televideo, trying to clear the image. I watched as the blob on the screen swelled and flickered. Suddenly it flashed into clear stark definition. Against a background of sparkling black, the twin spheres gleamed faintly in reflected starlight.

There were no visible surface features; the iodine-colored forms and their connecting shaft had an ancient and alien look.

We held our course steadily, watching the stranger maneuver. Even at this distance it looked huge.

"Captain," Clay said, "I've been making a few rough calculations. The two spheres are about 800 yards in diameter, and

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at the rate the structure is rotating it's pulling about six gravities."

That settled the question of human origin of the ship. No human crew would choose to work under six gee's.

Now, paralleling us at just over two hundred miles, the giant ship spun along, at rest relative to us. It was visible now through the direct observation panel, without magnification.

I left Clay in charge on the bridge, and I went down to the Com Section.

Joyce sat at his board, reading instruments and keying controls. So he was back on the job. Mannion sat, head bent, monitoring his recorder. The room was filled with the keening staccatto of the alien transmission.

"Getting anything on video?" I asked. Joyce shook his head. "Nothing, Captain. I've checked the whole spectrum, and this is all I get. It's coming in on about a dozen different frequencies; no FM."

"Any progress, Mannion?" I said.

He took off his headset. "It's the same thing, repeated over and over, just a short phrase. I'd have better luck if they'd vary it a little."

"Try sending," I said.

Joyce tuned the clatter down to a faint clicking, and switched his transmitter on. "You're on, Captain," he said.

"This is Captain Greylorn, UNACV Galahad; kindly identify yourself." I repeated this slowly, half a dozen times. It occurred to me that this was the first known time in history a human being had addressed a nonhuman intelligence. The last was a guess, but I couldn't interpret our guest's purposeful maneuverings as other than intelligent.

I checked with the bridge; no change. Suddenly the clatter stopped, leaving only the carrier hum.

"Can't you tune that whine out, Joyce?" I asked.

"No, sir," he replied. "That's a very noisy transmission. Sounds like maybe their equipment is on the blink."

We listened to the hum, waiting. Then the clatter began again.

"This is different," Mannion said. "It's longer."

I went back to the bridge, and waited for the next move from the stranger, or for word from Mannion. Every half hour I transmitted a call identifying us, followed by a sample of our language. I gave them English, Russian, and Standard Interlingua. I didn't know why, but somehow I had a faint hope they might understand some of it.

I stayed on the bridge when the watch changed. I had some food sent up, and slept a few hours on the OD's bunk.

Fine replaced Kramer on his watch when it rolled around. Apparently Kramer was out of circulation. At this point I did not feel inclined to pursue the point.

We had been at General Quar-

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ters for twenty-one hours when the wall annunciator hummed.

"Captain, this is Mannion. I've busted it . . ."

"I'll be right there," I said, and left at a run.

Mannion was writing as I entered ComSection. He stopped his recorder and offered me a sheet. "This is what I've got so far, Captain," he said.

I read: INVADER; THE MANCJI PRESENCE OPENS COMMUNICATIONS.

"That's a highly inflected version of early Interlingua, Captain," Mannion said. "After I taped it, I compensated it to take out the rise-and-fall tone, and then filtered out the static. There were a few sound substitutions to figure out, but I finally caught on. It still doesn't make much sense, but that's what it says."

"I wonder what we're invading," I said. "And what is the 'Mancji Presence'?"

"They just repeat that over and over," Mannion said. "They don't answer our call."

"Try translating into old Interlingua, adding their sound changes, and then feeding their own rise-and-fall routine to it," I said. "Maybe that will get a response."

I waited while Mannion worked out the message, then taped it on top of their whining tone pattern. "Put plenty of horsepower behind it," I said. "If their receivers are as shaky as their transmitter, they might not be hearing us."

We sent for five minutes, then tuned them back in and waited. There was a long silence from their side, then they came back with a long spluttering singsong.

Mannion worked over it for several minutes. "They must have understood us, here's what I get," he said:

THAT WHICH SWIMS IN THE MANCJI SEA; WE ARE AWARE THAT YOU HAVE THIS TRADE TONGUE. YOU RANGE FAR. IT IS OUR WHIM TO INDULGE YOU; WE ARE AMUSED THAT YOU PRESUME HERE; WE ACKNOWLEDGE YOUR INSOLENT DEMANDS.

"It looks like we're in somebody's back yard," I said. "They acknowledge our insolent demands, but they don't answer them." I thought a moment. "Send this," I said. "We'll outstrut them:"

THE MIGHTY WARSHIP GALAHAD REJECTS YOUR JURISDICTION.
TELL US THE NATURE OF YOUR DISTRESS AND WE MAY CHOOSE TO OFFER AID.

Mannion raised an eyebrow. "That ought to rock them," he said.

"They were eager to talk to us," I said. "That means they want something, in my opinion. And all the big talk sounds like a bluff of our own is our best line."

"Why do you want to antag-

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onize them, Captain?" Joyce asked. "That ship is over a thousand times the size of this can."

"Joyce, I suggest you let me forget you're around," I said.

The Mancji whine was added to my message, and it went out. Moments later this came back:

MANCJI HONOR DICTATES YOUR SAFE-CONDUCT; TALK IS WEARYING; WE FIND IT CONVENIENT TO SOLICIT A TRANSFER OF ELECTROSTATIC FORCE.

"What the devil does that mean?" I said. "Tell them to loosen up and explain themselves."

Mannion wrote out a straight query, and sent it. Again we waited for a reply.

It came, in a long windy paragraph stating that the Mancji found electro-static baths amusing, and that "crystalization" had drained their tanks. They wanted a flow of electrons from us to replenish their supply.

"This sounds like simple electric current they're talking about, Captain," Mannion said. "They want a battery charge."

They seem to have power to burn," I said. "Why don't they generate their own juice? Ask them; and find out where they learned Interlingua."

Mannion sent again; the reply was slow in coming back. Finally we got it:

THE MANCJI DO NOT EMPLOY MASSIVE GENERATION-PIECE WHERE ACCUMULATOR-PIECE IS SUFFICIENT. THIS SIMPLE TRADE SPEECH IS OF OLD KNOWLEDGE. WE SELECT IT FROM SYMBOLS WE ARE PLEASED TO SENSE EMPATTERNED ON YOUR HULL.

That made some sort of sense, but I was intrigued by the reference to Interlingua as a trade language. I wanted to know where they had learned it. I couldn't help the hope I started building on the idea that this giant knew our colony, in spite of the fact that they were using an antique version of the language, predating Omega by several centuries.

I sent another query, but the reply was abrupt and told nothing except that Interlingua was of "old knowledge."

Then Mannion entered a long technical exchange, getting the details of the kind of electric power they wanted.

"We can give them what they want, no sweat, Captain," he said after half an hour's talk. "They want DC; 100 volt, 50 amp will do."

"Ask them to describe themselves," I directed. I was beginning to get an idea.

Mannion sent, got his reply. "They're molluscoid, Captain," he said. He looked shocked. "They weigh about two tons each."

"Ask them what they eat," I said.

I turned to Joyce as Mannion worked over the message. "Get

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Kramer up here, on the double," I said.

Kramer came in five minutes later, looking drawn and rumpled. He stared at me sullenly.

"I'm releasing you from arrest temporarily on your own parole, Major," I said. "I want you to study the reply to our last transmission, and tell me what you can about it."

"Why me?" Kramer said. "I don't know what's going on." I didn't answer him.

There was a long tense half hour wait before Mannion copied out the reply that came in a stuttering nasal. He handed it to me.

As I had hoped, the message, after a preliminary recital of the indifference of the Mancji to biological processes of ingestion, recited a list of standard biochemical symbols.

"Can we eat this stuff?" I asked Kramer, handing him the sheet.

He studied it, and some of his accustomed swagger began to return. "I don't know what the flowery phrases are all about, but the symbols refer to common proteins, lipins, carbohydrates, vitamins, and biomins," he said. "What is this, a game?"

"All right, Mannion," I said. I was trying to hold back the excitement. "Ask them if they have fresh sources of these substances aboard."

The reply was quick; they did.

"Tell them we will exchange electric power for a supply of these foods. Tell them we want samples of half a dozen of the natural substances."

Again Mannion coded and sent, received and translated, sent again.

"They agree, Captain," he said at last. "They want us to fire a power lead out about a mile; they'll come in close and shoot us a specimen case with a flare on it. Then we can each check the other's merchandise."

"All right," I said. "We can use a ground-service cable; rig a pilot light on it, and kick it out, as soon as they get in close."

"We'll have to splice a couple of extra lengths to it," Mannion said.

"Go to it, Mannion," I said. "And send two of your men out to make the pick-up." This wasn't a communications job, but I wanted a reliable man handling it.

I returned to the bridge and keyed for Bourdon, directed him to arm two of his penetration missiles, lock them onto the stranger, and switch over to my control. With the firing key in my hand, I stood at the televideo screen and watched for any signs of treachery. The ship moved in, came to rest filling the screen.

Mannion's men reported out. I saw the red dot of our power lead move away, then a yellow point glowed on the side of the vast iodine-colored wall looming across the screen.

Nothing else emerged from the alien ship. The red pilot drifted across the face of the sphere. Mannion reported six

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thousand feet of cable out before the pilot disappeared abruptly.

"Captain," Mannion reported, "they're drawing power."

"O.K.," I said. "Let them have a sample, then shut down."

I waited, watching carefully, until Mannion reported the canister inside.

"Kramer," I said. "Run me a fast check on the samples in that container."

Kramer was recovering his swagger. "You'll have to be a little more specific," he said. "Just what kind of analysis do you have in mind? Do you want a full . . ."

"I just want to know one thing, Kramer," I said. "Can we assimilate these substances, yes or no. If you don't feel like cooperating, I'll have you lashed to your bunk, and injected with them. You claim you're a medical officer; let's see you act like one." I turned my back to him.

Mannion called. "They say the juice we fed them was 'amusing,' Captain. I guess that means it's O.K."

"I'll let you know in a few minutes how their samples pan out," I said.

Kramer took half an hour before reporting back. "I ran a simple check such as I normally use in a routine mess inspection," he began. He couldn't help trying to take the center of the stage to go into his Wise Doctor and Helpless Patient routine.

"Yes or no," I said.

"Yes, we can assimilate most of it," he said angrily. "There were six samples. Two were gelatinous substances, non-nutritive. Three were vegetable-like, bulky and fibrous, one with a high iodine content; the other was a very normal meaty specimen."

"Which should we take?" I said. "Remember your teeth when you answer."

"The high protein, the meaty one," he said. "Marked '6'."

I keyed for Mannion. "Tell them that in return for 1,000 KWH we require 3,000 kilos of sample six," I said.

Mannion reported back. "They agreed in a hurry, Captain. They seem to feel pretty good about the deal. They want to chat, now that they've got a bargain. I'm still taping a long tirade."

"Good," I said. "Better get ready to send about six men with an auxiliary pusher to bring home the bacon. You can start feeding them the juice again."

I turned to Kramer. He was staring at the video image. "Report yourself back to arrest in quarters, Kramer," I said. "I'll take your services today into account at your court-martial."

Kramer looked up, with a nasty grin. "I don't know what kind of talking oysters you're trafficking with, but I'd laugh like hell if they vaporized your precious tub as soon as they're through with you." He walked out.

Mannion called in again from ComSection. "Here's their last, Captain," he said. "They say

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we're lucky they had a good supply of this protein aboard. It's one of their most amusing foods. It's a creature they discovered in the wild state and it's very rare. The wild ones have died out, and only their domesticated herds exist."

"O.K., we're lucky," I said. "It better be good or we'll step up the amperage and burn their batteries for them."

"Here's more," Mannion said. "They say it will take a few hours to prepare the cargo. They want us to be amused."

I didn't like the delay, but it would take us about 10 hours to deliver the juice to them at the trickle rate they wanted. Since the sample was O.K., I was assuming the rest would be too. We settled down to wait.

I left Clay in charge on the bridge and made a tour of the ship. The meeting with the alien had apparently driven the mood of mutiny into the background. The men were quiet and busy. I went to my cabin and slept for a few hours.

I was awakened by a call from Clay telling me that the alien had released his cargo for us. Mannion's crew was out making the pick-up. Before they had maneuvered the bulky cylinder to the cargo hatch, the alien released our power lead.

I called Kramer and told him to meet the incoming crew and open and inspect the cargo. If it was the same as the sample, I thought, we had made a terrific trade. Discipline would recover if the men felt we still had our luck.

Then Mannion called again. "Captain," he said excitedly, "I think there may be trouble coming. Will you come down, sir?"

"I'll go to the bridge, Mannion," I said. "Keep talking."

I tuned my speaker down low and listened to Mannion as I ran for the lift.

"They tell us to watch for a little display of Mancji power. They ran out some kind of antenna. I'm getting a loud static at the top of my short wave receptivity."

I ran the lift up and as I stepped onto the bridge I said, "Clay, stand by to fire."

As soon as the pick-up crew was reported in, I keyed course corrections to curve us off sharply from the alien. I didn't know what he had, but I liked the idea of putting space between us. My P-Missiles were still armed and locked.

Mannion called, "Captain, they say our fright is amusing, and quite justified."

I watched the televideo screen for the first sign of an attack. Suddenly the entire screen went white, then blanked. Miller, who had been at the scanner searching over the alien ship at close range, reeled out of his seat, clutching at his eyes. "My God, I'm blinded," he shouted.

Mannion called, "Captain, my receivers blew. I think every tube in the shack exploded!"

I jumped to the direct viewer.

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The alien hung there, turning away from us in a leisurely curve. There was no sign of whatever had blown us off the air. I held my key, but didn't press it. I told Clay to take Miller down to Medic. He was moaning and in severe pain.

Kramer reported in from the cargo deck. The cannister was inside now, coating up with frost. I told him to wait, then sent Chilcote, my demolition man, in to open it. Maybe it was booby-trapped. I stood by at the DVP and waited for other signs of Mancjo power to hit us. The general feeling was tense.

Apparently they were satisfied with one blast of whatever it was; they were dwindling away with no further signs of life.

After half an hour of tense alertness, I ordered the missiles disarmed.

I keyed for General. "Men, this is the Captain," I said. "It looks as though our first contact with an alien race has been successfully completed. He is now at a distance of three hundred and moving off fast. Our screens are blown, but there's no real damage. And we have a supply of fresh food aboard; now let's get back to business. That colony can't be far off."

That may have been rushing it some, but if the food supply we'd gotten was a dud, we were finished anyway.

We watched the direct-view screen till the ship was lost; then followed on radar.

"It's moving right along, Captain," Joyce said, "accelerating at about two gee's."

"Good riddance," Clay said. "I don't like dealing with armed maniacs."

"They were screwballs all right," I said, "but they couldn't have happened along at a better time. I only wish we had been in a position to squeeze a few answers out of them."

"Yes, sir," Clay said. "Now that the whole thing's over, I'm beginning to think of a lot of questions myself."

The annunciator hummed. I heard what sounded like hoarse breathing. I glanced at the indicator light. It was the cargo deck mike that was open.

I keyed. "If you have a report, Chilcote, go ahead," I said.

Suddenly someone was shouting into the mike, incoherently. I caught words, cursing. Then Chilcote's voice, "Captain," he said. "Captain, please come quick." There was a loud clatter, noise, then only the hum of the mike.

"Take over, Clay," I said, and started back to the cargo deck at a dead run.

Men crowded the corridor, asking questions, milling. I forced my way through, found Kramer surrounded by men, shouting.

"Break this up, "I shouted. "Kramer, what's your report?"

Chilcote walked past me, pale as chalk. I pushed through to Kramer.

"Get hold of yourself, and

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make your report, Kramer," I said. "What started this riot?"

Kramer stopped shouting, and stood looking at me, panting. The crowded men fell silent.

"I gave you a job to do, Major," I said; "opening a cargo can. Now you take it from there."

"Yeah, Captain," he said. "We got it open. No wires, no traps. We hauled the load out of the can on to the floor. It was one big frozen mass, wrapped up in some kind of netting. Then we pulled the covering off."

"All right, go ahead," I said.

"That load of fresh meat your star-born pals gave us consists of about six families of human beings; men, women, and children." Kramer was talking for the crowd now, shouting. "Those last should be pretty tender when you ration out our ounce a week, Captain."

The men milled, wide-eyed, open-mouthed, as I thrust through to the cargo lock. The door stood ajar and wisps of white vapor curled out into the passage.

I stepped through the door. It was bitter cold in the lock. Near the outer hatch the bulky cannister, rimed with white frost, lay in a pool of melting ice. Before it lay the half shrouded bulk that it had contained. I walked closer.

They were frozen together into one solid mass. Kramer was right. They were as human as I. Human corpses, stripped, packed together, frozen. I pulled back the lightly frosted covering, and studied the glazed white bodies.

Kramer called suddenly from the door. "You found your colonists, Captain. Now that your curiosity is satisfied, we can go back where we belong. Out here man is a tame variety of cattle. We're lucky they didn't know we were the same variety, or we'd be in their food lockers now ourselves. Now let's get started back. The men won't take 'no' for an answer."

I leaned closer, studying the corpses. "Come here, Kramer," I called. "I want to show you something."

"I've seen all there is to see in there," Kramer said. "We don't want to waste time; we want to change course now, right away."

I walked back to the door, and as Kramer stepped back to let me precede him out the door, I hit him in the mouth with all my strength. His head snapped back against the frosted wall. Then he fell out into the passage.

I stepped over him. "Pick this up and put it in the brig," I said. The men in the corridor fell back, muttering. As they hauled Kramer upright I stepped through them and kept going, not running but wasting no time, toward the bridge. One wrong move on my part now and all their misery and fear would break loose in a riot the first act of which would be to tear me limb from limb.

I travelled ahead of the shock. Kramer had provided the diver-

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sion I had needed. Now I heard the sound of gathering violence growing behind me.

I was none too quick. A needler flashed at the end of the corridor just as the lift door closed. I heard the tiny projectile richochet off the lift shaft.

I rode up, stepped onto the bridge and locked the lift. I keyed for Bourdon, and to my relief got a quick response. The panic hadn't penetrated to Missile Section yet.

"Bourdon, arm all batteries and lock onto that Mancji ship," I ordered. "On the triple."

I turned to Clay. "I'll take over, Clay," I said. "Alter course to intercept our late companion at two and one-half gee's."

Clay looked startled, but said only, "Aye, sir."

I keyed for a general announcement. "This is the Captain," I said. "Action station, all hands in loose acceleration harness. We're going after Big Brother. You're in action against the enemy now, and from this point on I'm remembering. You men have been having a big time letting off steam; that's over now. All sections report."

One by one the sections reported in, all but Med. and Admin. Well, I could spare them for the present. The pressure was building now, as we blasted around in a hairpin curve, our acceleration picking up fast.

I ordered Joyce to lock his radar on taget, and switch over to autopilot control. Then I called Power Section.

"I'm taking over all power control from the bridge," I said. "All personnel out of the power chamber and control chamber."

The men were still under control, but that might not last long. I had to have the entire disposition of the ship's power, control, and armament under my personal direction for a few hours at least.

Missile Section reported all missiles armed and locked on target. I acknowledged and ordered the section evacuated. Then I turned to Clay and Joyce. Both were plenty nervous now; they didn't know what was brewing.

"Lieutenant Clay," I said. "Report to your quarters; Joyce, you too. I want to congratulate both of you on a soldierly performance these last few hours."

They left without protest. I was aware that they didn't want to be too closely identified with the Captain when things broke loose.

I keyed for a video check of the interior of the lift as it started back up. It was empty. I locked it up.

Now we were steady on course, and had reached our full two and a half gees. I could hardly stand under that acceleration, but I had one more job to do before I could take a break.

Feet dragging, I unlocked the lift and rode it down. I was braced for violence as I opened the lift door, but I was lucky. There was no one in the corri-

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dor. I could hear shouts in the distance. I dragged myself along to Power Section and pushed inside. A quick check of control settings showed everything as I had ordered it. Back in the passage, I slammed the leaded vault door to and threw in the combination lock. Now only I could open it without blasting.

Control Section was next. It, too, was empty, all in order. I locked it, and started across to Missiles. Two men appeared at the end of the passage, having as hard a time as I was. I entered the cross corridor just in time to escape a volley of needler shots. The mutiny was in the open now, for sure.

I kept going, hearing more shouting. I was sure the men I had seen were heading for Power and Control. They'd get a surprise. I hoped I could beat them to the draw at Missiles, too.

As I came out in B corridor, twenty feet from Missiles, I saw that I had cut it a bit fine. Three men, crawling, were frantically striving against the multi-gee field to reach the door before me. Their faces were running with sweat, purple with exertion.

I had a slight lead; it was too late to make a check inside before locking up. The best I could hope for was to lock the door before they reached it.

I drew my Browning and started for the door. They saw me and one reached for his needler.

"Don't try it," I called. I concentrated on the door, reached it, swung it closed, and as I threw in the lock a needler cracked. I whirled and fired. The man in the rear had stopped and aimed as the other two came on. He folded. The other two kept coming.

I was tired. I wanted a rest. "You're too late," I said. "No one but the Captain goes in there now." I stopped talking, panting. I had to rest. The two came on. I wondered why they struggled so desperately after they were beaten. My thinking was slowing down.

I suddenly realized they might be holding me for the crowd to arrive. I shuffled backwards towards the cross corridor. I barely made it. Two men on a shuttle cart whirled around the corner a hundred feet aft. I lurched into my shelter in a hail of needler fire. One of the tiny slugs stung through my calf and ricocheted down the passage.

I called to the two I had raced; "Tell your boys if they ever want to open that door, just see the Captain."

I hesitated, considering whether or not to make a general statement.

"What the hell," I decided. "They all know there's a mutiny now. It won't hurt to get in a little life-insurance."

I keyed my mike. "This is the Captain," I said. "This ship is now in a state of mutiny. I call on all loyal members of the Armed Forces to resist the mu-

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tineers actively, and to support their Commander. Your ship is in action against an armed enemy. I assure you this mutiny will fail, and those who took part in it will be treated as traitors to their Service, their homes, and their own families who now rely on them.

"We are accelerating at two and one-half gravities, locked on a collision course with the Mancji ship. The mutineers cannot enter the Bridge, Power, Control, or Missiles Sections since only I have the combination. Thus they're doomed to failure.

"I am now returning to the Bridge to direct the attack and destruction of the enemy. If I fail to reach the Bridge, we will collide with the enemy in less than three hours, and our batteries will blow."

Now my problem was to make good my remark about returning to the Bridge. The shuttle had not followed me, presumably fearing ambush. I took advantage of their hesitation to cross back to corridor A at my best speed. I paused once to send a hail of needles ricocheted down the corridor behind me, and I heard a yelp from around the corner. Those needles had a fantastic velocity, and bounced around a long time before stopping.

At the corridor, I lay down on the floor for a rest and risked a quick look. A group of three men were bunched around the Control Section door, packing smashite in the hairline crack around it. That wouldn't do them any good, but it did occupy their attention.

I faded back into the cross passage, and keyed the mike. I had to give them a chance.

"This is the Captain," I said. "All personnel not at their action stations are warned for the last time to report there immediately. Any man found away from his post from this point on is in open mutiny and can expect the death penalty. This is the last warning."

The men in the corridor had heard, but a glance showed they paid no attention to what they considered an idle threat. They didn't know how near I was.

I drew my needler, set it for continuous fire, pushed into the corridor, aimed, and fired. I shot to kill. All three sprawled away from the door, riddled, as the metal walls rang with the cloud of needles.

I looked both ways, then rose, with effort, and went to the bodies. I recognized them as members of Kirschenbaum's Power Section crew. I keyed again as I moved on toward the lift at the end of the corridor, glancing back as I went.

"Corley, Mac Williams, and Reardon have been shot for mutiny in the face of the enemy," I said. "Let's hope they're the last to insist on my enforcing the death penalty."

Behind me, at the far end of the corridor, men appeared

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again. I flattened myself in a doorway, sprayed needles toward them, and hoped for the best. I heard the singing of a swarm past me, but felt no hits. The mutineers offered a bigger target, and I thought I saw someone fall. As they all moved back out of sight, I made another break for the lift.

I was grateful they hadn't had time to organize. I kept an eye to the rear, and sent a hail of needles back every time a man showed himself. They ducked out to fire every few seconds, but not very effectively. I had an advantage over them; I was fighting for the success of the mission and for my life, with no one to look to for help; they were each one of a mob, none eager to be a target, each willing to let the other man take the risk.

I was getting pretty tired. I was grateful for the extra stamina and wind that daily calisthenics in a high-gee field had given me; without that I would have collapsed before now; but I was almost ready to drop. I had my eyes fixed on the lift door; each step, inch by inch, was an almost unbearable effort. With only a few feet to go, my knees gave; I went down on all fours. Another batch of needles sang around me, and vivid pain seared my left arm. It helped. The pain cleared my head, spurred me. I rose and stumbled against the door.

Now the combination. I fought a numbing desire to faint as I pressed the lock control; three, five, two, five . . .

I twisted around as I heard a sound. The shuttle was coming toward me, men lying flat on it, protected by the bumper plate. I leaned against the lift door, and loosed a stream of needles against the side of the corridor, banking them toward the shuttle. Two men rolled off the shuttle in a spatter of blood. Another screamed, and a hand waved above the bumper. I needled it.

I wondered how many were on the shuttle. It kept coming. The closer it came, the more effective my bank shots were. I wondered why it failed to return my fire. Then a hand rose in an arc and a choke bomb dropped in a short curve to the floor. It rolled to my feet, just starting to spew. I kicked it back. The shuttle stopped, backed away from the bomb. A jet of brown gas was playing from it now. I aimed my needler, and sent it spinning back farther. Then I turned to my lock.

Now a clank of metal against metal sounded behind me; from the side passage a figure in radiation armor moved out. The suit was self-powered and needle proof. I sent a concentrated blast at the head, as the figure awkwardly tottered toward me, ungainly in the multi-gee field. The needles hit, snapped the head back. The suited figure hesitated, arms spread, stepped back and fell with a thunderous

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crash. I had managed to knock him off balance, maybe stun him.

I struggled to remember where I was in the code sequence; I went on, keyed the rest. I pushed; nothing. I must have lost count. I started again.

I heard the armored man coming on again. The needler trick wouldn't work twice. I kept working. I had almost completed the sequence when I felt the powered grip of the suited man on my arm. I twisted, jammed the needler against his hand, and fired. The arm flew back, and even through the suit I heard his wrist snap. My own hand was numb from the recoil. The other arm of the suit swept down and struck my wounded arm. I staggered away from the door, dazed with the pain.

I side-stepped in time to miss another ponderous blow. Under two and a half gees, the man in the suit was having a hard time, even with power assisted controls. I felt that I was fighting a machine instead of a man.

As he stepped toward me again, I aimed at his foot. A concentrated stream of needles hit, like a metallic fire hose, knocked the foot aside, toppled the man again. I staggered back to my door.

But now I realized I couldn't risk opening it; even if I got in, I couldn't keep my suited assailant from crowding in with me. Already he was up, lurching toward me. I had to draw him away from the door.

The shuttle sat unmoving. The mob kept its distance. I wondered why no one was shooting; I guessed they had realized that if I were killed there would be no way to enter the vital control areas of the ship; they had to take me alive.

I made it past the clumsy armored man and started down the corridor toward the shuttle. I moved as slowly as I could while still eluding him. He lumbered after me. I reached the shuttle; a glance showed no one alive there. Two men lay across it. I pulled myself onto it and threw in the forward lever. The shuttle rolled smoothly past the armored man, striking him a glancing blow that sent him down again. Those falls, in the multi-gee field, were bone crushing. He didn't get up.

I reached the door again, rolled off the shuttle, and reached for the combination. I wished now I'd used a shorter one. I started again; heard a noise behind me. As I turned, a heavy weight crushed me against the door.

I was held rigid, my chest against the combination key. The pressure was cracking my ribs and still it increased. I twisted my head, gasping. The shuttle held me pinned to the door. The man I had assumed out of action was alive enough to hold the lever down with savage strength. I tried to shout, to remind him that without me to open the doors, they were powerless to save the ship. I couldn't

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speak. I tasted blood in my mouth, and tried to breathe. I couldn't. I passed out.

CHAPTER 2

I EMERGED into consciousness to find the pressure gone, but a red haze of pain remained. I lay on my back and saw men sitting on the floor around me.

A blow from somewhere made my head ring. I tried to sit up. I couldn't make it. Then Kramer was beside me, slipping a needle into my arm. He looked pretty bad himself. His face was bandaged heavily, and one eye was purple. He spoke in a muffled voice through stiff jaws. His tone was deliberate.

"This will keep you conscious enough to answer a few questions," he said. "Now you're going to give me the combinations to the locks so we can call off this suicide run; then maybe I'll doctor you up."

I didn't answer.

"The time for clamming up is over, you stupid braggard," Kramer said. He raised his fist and drove a hard punch into my chest. I guess it was his shot that kept me conscious. I couldn't breathe for a while, until Kramer gave me a few whiffs of oxygen. I wondered if he was fool enough to think I might give up my ship.

After a while my head cleared a little. I tried to say something. I got out a couple of croaks, and then found my voice.

"Kramer," I said.

He leaned over me. "I'm listening," he said.

"Take me to the lift. Leave me there alone. That's your only chance." It seemed to me like a long speech, but nothing happened. Kramer went away, came back. He showed me a large scalpel from his medical kit. "I'm going to start operating on your face. I'll make you into a museum freak. Maybe if you start talking soon enough I'll change my mind."

I could see the watch on his wrist. My mind worked very slowly. I had trouble getting any air into my lungs. We would intercept in one hour and ten minutes.

It seemed simple to me. I had to get back to the Bridge before we hit. I tried again. "We only have an hour," I said.

Kramer lost control. He jabbed the knife at my face, screeching through gritted teeth. I jerked my head aside far enough that the scalpel grated along my cheekbone instead of slashing my mouth. I hardly felt it.

"We're not dying because you were a fool," Kramer yelled. "I've taken over; I've relieved you as unfit for command. Now open up this ship or I'll slice you to ribbons." He held the scalpel under my nose in a fist trembling with fury. The chrome plated blade had a thin film of pink on it.

I got my voice going again. "I'm going to destroy the Mancji ship," I said. "Take me to the

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lift and leave me there." I tried to add a few words, but had to stop and work on breathing again for a while. Kramer disappeared.

I realized I was not fully in command of my senses. I was clamped in a padded claw. I wanted to roll over. I tried hard, and made it. I could hear Kramer talking, others answering, but it seemed too great an effort to listen to the words.

I was lying on my face now, head almost against the wall. There was a black line in front of me, a door. My head cleared a bit. It must have been Kramer's shot working on me. I turned my head and saw Kramer standing now with half a dozen others, all talking at once. Apparently Kramer's display of uncontrolled temper had the others worried. They wanted me alive. Kramer didn't like anyone criticizing him. The argument was pretty violent. There was scuffling—and shouts.

I saw that I lay about twenty feet from the lift; too far. The door before me, if I remembered the ship's layout, was a utility room, small and containing nothing but a waste disposal hopper. But it did have a bolt on the inside, like every other room on the ship.

I didn't stop to think about it; I started trying to get up. If I'd thought I would have known that at the first move from me all seven of them would land on me at once. I concentrated on getting my hands under me, to push up. I heard a shout, and turning my head, saw Kramer swinging at someone. I went on with my project.

Hands under my chest, I raised myself a little, and got a knee up. I felt broken rib ends grating, but felt no pain, just the padded claw. Then I was weaving on all fours. I looked up, spotted the latch on the door, and put everything I had into lunging at it. My finger hit it, the door swung in, and I fell on my face; but I was half in. Another lunge and I was past the door, kicking it shut as I lay on the floor, reaching for the lock control. Just as I flipped it with an extended finger, someone hit the door from outside, a second too late.

It was dark, and I lay on my back on the floor, and felt strange short-circuited stabs of what would have been agonizing pain running through my chest and arm. I had a few minutes to rest now, before they blasted the door open.

I hated to lose like this, not because we were beaten, but because we were giving up. My poor world, no longer fair and green, had found the strength to send us out as her last hope. But somewhere out here in the loneliness and distance we had lost our courage. Success was at our fingertips, if we could have found it; instead, in panic and madness, we were destroying ourselves.

My mind wandered; I imag-

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ined myself on the Bridge, half-believed I was there. I was resting on the OD bunk, and Clay was standing beside me. A long time seemed to pass . . . Then I remembered I was on the floor, bleeding internally, in a tiny room that would soon lose its door. But there was someone standing beside me.

I didn't feel too disappointed at being beaten; I hadn't hoped for much more than a breather, anyway. I wondered why this fellow had abandoned his action station to hide there. The door was still shut. He must have been there all along, but I hadn't seen him when I came in. He stood over me, wearing greasy overalls, and grinned down at me. He raised his hand. I was getting pretty indifferent to blows; I couldn't feel them.

The hand went up, the man straightened and held a fairly snappy salute. "Sir," he said. "Space'n first class Thomas."

I didn't feel like laughing or cheering or anything else; I just took it as it came.

"At ease, Thomas," I managed to say. "Why aren't you at your duty station?" I went spinning off somewhere after that oration.

Thomas was squatting beside me now. "Cap'n, you're hurt, ain't you? I was wonderin' why you was down here layin down in my 'Sposal station."

"A scratch," I said. I thought about it for a while. Thomas was doing something about my chest. This was Thomas' disposal station. Thomas owned it. I wondered if a fellow could make a living with such a small place way out here, with just an occasional tourist coming by. I wondered why I didn't send one of them for help; I needed help for some reason . . .

"Cap'n, I been overhaulin' my converter units, I jist come in. How long you been in here, Cap'n?" Thomas was worried about something.

I tried hard to think. I hadn't been here very long; just a few minutes. I had come here to rest . . . Then suddenly I was thinking clearly again.

Whatever Thomas was, he was apparently on my side, or at least neutral. He didn't seem to be aware of the mutiny. I realized that he had bound my chest tightly with strips of shirt; it felt better.

"What are you doing in here, Thomas?" I asked. "Don't you know we're in action against a hostile ship?"

Thomas looked surprised. "This here's my action station, Cap'n," he said. "I'm a Waste Recovery Technician, First Class, I keep the recovery system operatin'."

"You just stay in here?" I asked.

"No, sir," Thomas said. "I check through the whole system. We got three main disposal points and lots a little ones, an' I have to keep everything operatin'. Otherwise this ship would be in a bad way, Cap'n."

"How did you get in here?" I

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asked. I looked around the small room. There was only one door, and the gray bulk of the converter unit which broke down wastes into their component elements for re-use nearly filled the tiny space.

"I come in through the duct, Cap'n," Thomas said. "I check the ducts every day. You know, Cap'n," he said shaking his head, "they's some bad laid-out ductin' in this here system. If I didn't keep after it, you'd be gettin' clogged ducts all the time. So I jist go through the system and keep her clear."

From somewhere, hope began again. "Where do these ducts lead?" I asked. I wondered how the man could ignore the mutiny going on around him.

"Well, sir, one leads to the mess; that's the big one. One leads to the wardroom, and the other one leads up to the Bridge."

My God, I thought, the Bridge.

"How big are they?" I asked. "Could I get through them?"

"Oh, sure, Cap'n," Thomas said. "You can get through 'em easy. But are you sure you feel like inspectin' with them busted ribs?"

I was beginning to realize that Thomas was not precisely a genius. "I can make it," I said.

"Cap'n," Thomas said diffidently, "it ain't none a my business, but don't you think maybe I better get the doctor for ya?"

"Thomas," I said, "maybe you don't know; there's a mutiny under way aboard this ship. The doctor is leading it. I want to get to the Bridge in the worst way. Let's get started."

Thomas looked very shocked. "Cap'n, you mean you was hurt by somebody? I mean you didn't have a fall or nothin', you was beat up?" He stared at me with an expression of incredulous horror.

"That's about the size of it," I said. I managed to sit up. Thomas jumped forward and helped me to my feet. Then I saw that he was crying.

"You can count on me, Cap'n," he said. "Jist lemme know who done it, an' I'll feed 'em into my converter."

I stood leaning against the wall, waiting for my head to stop spinning. Breathing was difficult, but if I kept it shallow, I could manage. Thomas was opening a panel on the side of the converter unit.

"It's O.K. to go in Cap'n," he said. "She ain't operatin'."

The pull of the two and a half gees seemed to bother him very little. I could barely stand under it, holding on. Thomas saw my wavering step and jumped to help me. He boosted me into the chamber of the converter and pointed out an opening near the top, about twelve by twenty-four inches.

"That there one is to the Bridge, Cap'n," he said. "If you'll start in there, sir, I'll follow up."

I thrust head and shoulders

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into the opening. Inside it was smooth metal, with no handholds. I clawed at it trying to get farther in. The pain stabbed at my chest.

"Cap'n, they're workin' on the door," Thomas said. "They already been at it for a little while. We better get goin'."

"You'd better give me a push, Thomas," I said. My voice echoed hollowly down the duct.

Thomas crowded into the chamber behind me then, lifting my legs and pushing. I eased into the duct. The pain was not so bad now.

"Cap'n, you gotta use a special kinda crawl to get through these here ducts," Thomas said. "You grip your hands together out in front of ya, and then bend your elbows. When your elbows jam against the side of the duct, you pull forward."

I tried it; it was slow, but it worked.

"Cap'n," Thomas said behind me. "We got about seven minutes now to get up there. I set the control on the converter to start up in ten minutes. I think we can make it O.K., and ain't nobody else comin' this way with the converter goin'. I locked the control panel so they can't shut her down."

That news spurred me on. With the converter in operation, the first step in the cycle was the evacuation of the ducts to a near-perfect vacuum. When that happened, we would die instantly with ruptured lungs; then our dead bodies would be sucked into the chamber and broken down into useful raw materials. I hurried.

I tried to orient myself. The duct paralleled the corridor. It would continue in that direction for about fifteen feet, and would then turn upward, since the Bridge was some fifteen feet above this level. I hitched along, and felt the duct begin to trend upward.

"You'll have to get on your back here, Cap'n," Thomas said. "She widens out on the turn."

I managed to twist over. Thomas was helping me by pushing at my feet. As I reached a near-vertical position, I felt a metal rod under my hand. That was a relief; I had been expecting to have to go up the last stretch the way a mountain climber does a rock chimney, back against one wall and feet against the other.

I hauled at the rod, and found another with my other hand. Below, Thomas boosted me. I groped up and got another, then another. The remaining slight slant of the duct helped. Finally my feet were on the rods. I clung, panting. The heat in the duct was terrific. Then I went on up. That was some shot Kramer had given me.

Above I could see the end of the duct faintly in the light coming up through the open chamber door from the utility room. I remembered the location of the disposal slot on the Bridge now; it had been installed in the small

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apartment containing a bunk and a tiny galley for the use of the Duty Officer during long watches on the Bridge.

I reached the top of the duct and pushed against the slot cover. It swung out easily. I could see the end of the chart table, and beyond, the dead radar screen. I reached through and heaved myself partly out. I nearly fainted at the stab from my ribs as my weight went on my chest. My head sang. The light from below suddenly went out. I heard a muffled clank; then a hum began, echoing up the duct.

"She's closed and started cyclin' the air out, Cap'n," Thomas said calmly. "We got about half a minute."

I clamped my teeth together and heaved again. Below me Thomas waited quietly. He couldn't help me now. I got my hands flat against the bulkhead and thrust. The air was whistling around my face. Papers began to swirl off the chart table. I twisted my body frantically, kicking loose from the grip of the slot, fighting the sucking pull of air. I fell to the floor inside the room, the slot cover slamming behind me. I staggered to my feet. I pried at the cover, but I couldn't open it against the vacuum. Then it budged, and Thomas' hand came through. The metal edge cut into it, blood started, but the cover was held open half an inch. I reached the chart table, almost falling over my leaden feet, seized a short permal T-square, and levered the cover up. Once started, it went up easily. Thomas' face appeared, drawn and pale, eyes closed against the dust being whirled into his face. He got his arms through, heaved himself a little higher. I seized his arm and pulled. He scrambled through.

I knocked the T-square out of the way and the cover snapped down. Then I slid to the floor, not exactly out, but needing a break pretty bad. Thomas brought bedding from the OD bunk and made me comfortable on the floor.

"Thomas," I said, "when I think of what the security inspectors who approved the plans for this arrangement are going to say when I call this little back door to their attention, it almost makes it worth the trouble."

"Yes, sir," Thomas said. He sprawled on the deck and looked around the Bridge, staring at the unfamiliar screens, indicator dials, controls.

From where I lay, I could see the direct vision screen. I wasn't sure, but I thought the small bright object in the center of it might be our target. Thomas looked at the dead radar screen, then said, "Cap'n, that there radarscope out of action?"

"It sure is, Thomas," I said. "Our unknown friends blew the works before they left us." I was surprised that he recognized a radarscope.

"Mind if I take a look at it, Cap'n?" he said.

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"Go ahead," I replied. I tried to explain the situation to Thomas. The elapsed time since we had started our pursuit was two hours and ten minutes; I wanted to close to no more than a twenty mile gap before launching my missiles; and I had better alert my interceptor missiles in case the Mancji hit first.

Thomas had the cover off the radar panel and was probing around. He pulled a blackened card out of the interior of the panel.

"Looks like they overloaded the fuse," Thomas said. "Got any spares. Cap'n?"

"Right beside you in the cabinet," I said. "How do you know your way around a radar set, Thomas?"

Thomas grinned. "I useta be a radar technician third before I got inta waste disposal," he said. "I had to change specialities to sign on for this cruise."

I had an idea there'd be an opening for Thomas a little higher up when this was over.

I asked him to take a look at the televideo, too. I was beginning to realize that Thomas was not really simple; he was merely uncomplicated.

"Tubes blowed here, Cap'n," he reported. "Like as if you was to set her up to high mag right near a sun; she was overloaded. I can fix her easy if we got the spares."

I didn't take time to try to figure that one out. I could feel the dizziness coming on again.

"Thomas," I called, "let me know when we're at twenty miles from target." I wanted to tell him more, but I could feel consciousness draining away. "Then . . ." I managed, "first aid kit . . . shot . . ."

I could still hear Thomas. I was flying away, whirling, but I could hear his voice. "Cap'n, I could fire your missiles now, if you was to want me to," he was saying. I struggled to speak. "No. Wait." I hoped he heard me.

I floated a long time in a strange state between coma and consciousness. The stuff Kramer had given me was potent. It kept my mind fairly clear even when my senses were out of action. I thought about the situation aboard my ship.

I wondered what Kramer and his men were planning now, how they felt about having let me slip through their fingers. The only thing they could try now was blasting their way into the Bridge. They'd never make it. The designers of these ships were not unaware of the hazards of space life; the Bridge was an unassailable fortress. They couldn't possibly get to it.

I guessed that Kramer was having a pretty rough time of it now. He had convinced the men that we were rushing headlong to sure destruction at the hands of the all-powerful Mancji, and that their Captain was a fool. Now he was trapped with them in the panic he had helped to create. I thought that in all

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probability they had torn him apart.

I wavered in and out of consciousness. It was just as well; I needed the rest. Then I heard Thomas calling me. "We're closin' now, Cap'n," he said. "Wake up, Cap'n, only twenty-three miles now."

"Okay," I said. My body had been preparing itself for this, now it was ready again. I felt the needle in my arm. That helped, too.

"Hand me the intercom, Thomas," I said. He placed the mike in my hand. I keyed for a general announcement.

"This is the Captain," I said. I tried to keep my voice as steady as possible. "We are now at a distance of twenty-one miles from the enemy. Stand by for missile launching and possible evasive action. Damage control crews on the alert." I paused for breath.

"Now we're going to take out the Mancji ship, men," I said. "All two miles of it."

I dropped the mike and groped for the firing key. Thomas handed it to me.

"Cap'n," he said, bending over me. "I notice you got the selector set for your chemical warheads. You wouldn't want me to set up pluto heads for ya, would ya, Cap'n?"

"No, thanks, Thomas," I said. "Chemical is what I want. Stand by to observe." I pressed the firing key.

Thomas was at the radarscope. "Missiles away, Cap'n. Trackin' O.K. Looks like they'll take out the left half a that dumbbell."

I found the mike again. "Missiles homing on target," I said. "Strike in thirty-five seconds. You'll be interested to know we're employing chemical warheads. So far there is no sign of offense or defense from the enemy." I figured the news would shock a few mutineers. David wasn't even using his slingshot on Goliath. He was going after him bare-handed. I wanted to scare some kind of response out of them. I needed a few clues as to what was going on below.

I got it. Joyce's voice came from the wall annunciator. "Captain, this is Lt. Joyce reporting." He sounded scared all the way through, and desperate. "Sir, the mutiny has been successfully suppressed by the loyal members of the crew. Major Kramer is under arrest. We're prepared to go on with the search for the Omega Colony. But Sir . . ." he paused, gulping. "We ask you to change course now before launching any effective attack. We still have a chance. Maybe they won't bother with us when those firecrackers go off . . ."

I watched the direct vision screen. Zero second closed in. And on the screen the face of the left hand disk of the Mancji ship was lit momentarily by a brilliant spark of yellow, then another. A discoloration showed dimly against the dark metallic surface. It spread, and a faint vapor formed over it. Now tiny

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specs could be seen moving away from the ship. The disk elongated, with infinite leisure, widening.

"What's happenin'? Cap'n?" Thomas asked. He was staring at the scope in fascination. "They launchin' scouts, or what?"

"Take a look here, Thomas," I said. "The ship is breaking up."

The disk was an impossibly long ellipse now, surrounded by a vast array of smaller bodies, fragments and contents of the ship. Now the stricken globe moved completely free of its companion. It rotated, presenting a crescent toward us, then wheeled farther as it receded from its twin, showing its elongation. The sphere had split wide open. Now the shattered half itself separated into two halves, and these in turn crumbled, strewing debris in a widening spiral.

"My God, Cap'n," Thomas said in awe. "That's the greatest display I ever seen. And all it took to set her off was 200 kilos a PBL. Now that's somethin'."

I keyed the mike again. "This is the Captain," I said. "I want ten four-man patrols ready to go out in fifteen minutes. The enemy ship has been put out of action and is now in a derelict condition. I want only one thing from her; one live prisoner. All Section chiefs report to me on the Bridge on the triple."

"Thomas," I said, "go down in the lift and open up for the Chiefs. Here's the release key for the combination; you know how to operate it?"

"Sure, Cap'n; but are you sure you want to let them boys in here after the way they jumped you an' all?"

I opened my mouth to answer, but he beat me to it. "Fergit I asked ya that, Cap'n, pleasir. You ain't been wrong yet."

"It's O.K., Thomas," I said. "There won't be any more trouble."

EPILOGUE

ON THE eve of the twentieth anniversay of Reunion Day, a throng of well-heeled celebrants filled the dining room and overflowed onto the terraces of the Star Tower Dining Room, from whose 5,700 foot height above the beaches, the Florida Keys, a hundred miles to the south, were visible on clear days.

The *Era* reporter stood beside the vast glass entry way surveying the crowd, searching for celebrities from whom he might elicit bits of color to spice the day's transmission.

At the far side of the room, surrounded by chattering admirers, stood the Ambassador from the New Terran Federation; a portly, graying, jolly ex-Naval officer. A minor actress passed at close range, looking the other way. A cabinet member stood at the bar talking earnestly to a ball player, ignoring a group of hopeful reporters and fans.

The *Era* stringer, an expe-

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rienced hand, passed over the hard pressed VIP's near the center of the room and started a face-by-face check of the less gregarious diners seated at obscure tables along the sides of the room.

He was in luck; the straight-backed gray-haired figure in the dark civilian suit, sitting alone at a tiny table in an alcove, caught his eye. He moved closer, straining for a clear glimpse through the crowd. Then he was sure. He had the biggest possible catch of the day in his sights; Admiral of Fleets Frederick Greylorn.

The reporter hesitated; he was well aware of the Admiral's reputation for near-absolute silence on the subject of his already legendary cruise, the fabulous voyage of the *Galahad*. He couldn't just barge in on the Admiral and demand answers, as was usual with publicity-hungry politicians and show people. He could score the biggest story of the century today; but he had to hit him right.

You couldn't hope to snow a man like the Admiral; he wasn't somebody you could push around. You could sense the solid iron of him from here.

Nobody else had noticed the solitary diner. The *Era* man drifted closer, moving unhurriedly, thinking furiously. It was no good trying some tricky approach; his best bet was the straight-from-the-shoulder bit. No point in hesitating. He stopped beside the table.

The Admiral was looking out across the Gulf. He turned and glanced up at the reporter.

The news man looked him squarely in the eye. I'm a reporter, Admiral," he said. "Will you talk to me?"

The Admiral nodded to the seat across from him. "Sit down," he said. He glanced around the room.

The reporter caught the look. "I'll keep it light, sir," he said. "I don't want company either." That was being frank.

"You want the answers to some questions, don't you?" the Admiral said.

"Why, yes, sir," the reporter said. He started to inconspicuously key his pocket recorder, but caught himself. "May I record your remarks, Admiral?" he said. Frankness all the way.

"Go ahead," said the Admiral.

"Now, Admiral," the reporter began, "the Terran public has of course . . ."

"Never mind the patter, son," the Admiral said mildly. "I know what the questions are. I've read all the memoirs of the crew. They've been coming out at the rate of about two a year for some time now. I had my own reasons for not wanting to add anything to my official statement."

The Admiral poured wine into his glass. "Excuse me," he said. "Will you join me?" He signalled the waiter.

"Another wine glass, please," he said. He looked at the golden

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wine in the glass, held it up to the light. "You know, the Florida wines are as good as any in the world," he said. "That's not to say the California and Ohio wines aren't good. But this Flora Pinellas is a genuine original, not an imitation Rhine; and it compares favorably with the best of the old vintages, particularly the '87."

The glass arrived and the waiter poured. The reporter had the wit to remain silent.

"The first question is usually, how did I know I could take the Mancji ship. After all, it was big, vast. It loomed over us like a mountain. The Mancji themselves weighed almost two tons each; they liked six gee gravity. They blasted our communication off the air, just for practice. They talked big, too. We were invaders in their territory. They were amused by us. So where did I get the notion that our attack would be anything more than a joke to them? That's the big question." The Admiral shook his head.

"The answer is quite simple. In the first place, they were pulling six gees by using a primitive dumbbell configuration. The only reason for that type of layout, as students of early space vessel design can tell you, is to simplify setting up a gee field effect using centrifugal force. So they obviously had no gravity field generators.

"Then their transmission was crude. All they had was simple, old-fashioned short-range radio, and even that was noisy and erratic. And their reception was as bad. We had to use a kilowatt before they could pick it up at 200 miles. We didn't know then it was all organically generated; that they had no equipment."

The Admiral sipped his wine, frowning at the recollection. "I was pretty sure they were bluffing when I changed course and started after them. I had to hold our acceleration down to two and a half gees because I had to be able to move around the ship. And at that acceleration we gained on them. They couldn't beat us. And it wasn't because they couldn't take high gees; they liked six for comfort, you remember. No, they just didn't have the power."

The Admiral looked out the window.

"Add to that the fact that they apparently couldn't generate ordinary electric current. I admit that none of this was conclusive, but after all, if I was wrong we were sunk anyway. When Thomas told me the nature of the damage to our radar and communications systems, that was another hint. Their big display of Mancji power was just a blast of radiation right across the communication spectrum; it burned tubes and blew fuses; nothing else. We were back in operation an hour after our attack.

"The evidence was there to see, but there's something about

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giant size that gets people rattled. Size alone doesn't mean a thing. It's rather like the bluff the Soviets ran on the rest of the world for a couple of decades back in the war era, just because they sprawled across half the globe. They were a giant, though it was mostly frozen desert. When the showdown came they didn't have it. They were a pushover.

"All right, the next question is why did I choose H. E. instead of going in with everything I had? That's easy, too. What I wanted was information, not revenge. I still had the heavy stuff in reserve and ready to go if I needed it, but first I had to try to take them alive. Vaporizing them wouldn't have helped our position. And I was lucky; it worked

"The, ah, confusion below evaporated as soon as the Section chiefs got a look at the screens and realized that we had actually knocked out the Mancji. We matched speeds with the wreckage and the patrols went out to look for a piece of ship with a survivor in it. If we'd had no luck we would have tackled the other half of the ship, which was still intact and moving off fast. But we got quite a shock when we found the nature of the wreckage." The Admiral grinned.

"Of course today everybody knows all about the Mancji hive intelligence, and their evolutionary history. But we were pretty startled to find that the only wreckage consisted of the Mancji themselves, each two-ton slug in his own hard chitin shell. Of course, a lot of the cells were ruptured by the explosions, but most of them had simply disassociated from the hive mass as it broke up. So there was no ship; just a cluster of cells like a giant bee hive, and mixed up among the slugs, the damnedest collection of loot you can imagine. The odds and ends they'd stolen and tucked away in the hive during a couple hundred years of camp-following.

"The patrols brought a couple of cells alongside, and Mannion went out to try to establish contact. Sure enough, he got a very faint transmission, on the same bands as before. The cells were talking to each other in their own language. They ignored Mannion even though his transmission must have blanketed everything within several hundred miles. We eventually brought one of them into the cargo lock and started trying different wave-lengths on it. Then Kramer had the idea of planting a couple of electrodes and shooting a little juice to it. Of course, it loved the DC, but as soon as we tried AC, it gave up. So we had a long talk with it and found out everything we needed to know.

"It was a four-week run to the nearest outpost planet of the New Terran Federation, and they took me on to New Terra aboard one of their fast liaison

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vessels. The rest you know. We, the home planet, were as lost to the New Terrans as they were to us. They greeted us as though we were their own ancestors come back to visit them.

"Most of my crew, for personal reasons, were released from duty there, and settled down to stay.

"The clean-up job here on Earth was a minor operation to their Navy. As I recall, the trip back was made in a little over five months, and the Red Tide was killed within four weeks of the day the task force arrived. I don't think they wasted a motion. One explosive charge per cell, of just sufficient size to disrupt the nucleus. When the critical number of cells had been killed, the rest died overnight.

"It was quite a different Earth that emerged from under the plague, though. You know it had taken over all of the land area except North America and a strip of Western Europe, and all of the sea it wanted. It was particularly concentrated over what had been the jungle areas of South America, Africa, and Asia. You must realize that in the days before the Tide, those areas were almost completely uninhabitable. You have no idea what the term Jungle really implied. When the Tide died, it disintegrated into its component molecules; and the result was that all those vast fertile Jungle lands were now beautifully levelled and completely cleared areas covered with up to twenty feet of the richest topsoil imaginable. That was what made it possible for old Terra to become what she is today; the Federation's truck farm, and the sole source of those genuine original Terran foods that all the rest of the worlds pay such fabulous prices for.

"Strange how quickly we forget. Few people today remember how we loathed and feared the Tide when we were fighting it. Now it's dismissed as a blessing in disguise."

The Admiral paused. "Well, he said, "I think that answers the questions and gives you a bit of homespun philosophy to go with it."

"Admiral," said the reporter, "you've given the public some facts it's waited a long time to hear. Coming from you, sir, this is the greatest story that could have come out of this Reunion Day celebration. But there is one question more, if I may ask it. Can you tell me, Admiral, just how it was that you rejected what seemed to be prima facie proof of the story the Mancji told; that they were the lords of creation out there, and that humanity was nothing but a tame food animal to them?"

The Admiral sighed. "I guess it's a good question," he said. "But there was nothing supernatural about my figuring that one. I didn't suspect the full truth, of course. It never occurred to me that we were the victims of the now well-known

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but still inexplicable sense of humor of the Mancji, or that they were nothing but scavengers around the edges of the Federation. The original Omega ship had met them and seen right through them.

"Well, when this hive spotted us coming in, they knew enough about New Terra to realize at once that we were strangers, coming from outside the area. It appealed to their sense of humor to have the gall to strut right out in front of us and try to put over a swindle. What a laugh for the oyster kingdom if they could sell Terrans on the idea that they were the master race. It never occurred to them that we might be anything but Terrans; Terrans who didn't know the Mancji. And they were canny enough to use an old form of Interlingua; somewhere they'd met men before.

"Then we needed food. They knew what we ate, and that was where they went too far. They had, among the flotsam in their hive, a few human bodies they had picked up from some wreck they'd come across in their travels. They had them stashed away like everything else they could lay a pseudopod on. So they stacked them the way they'd seen Terran frozen foods shipped in the past, and sent them over. Another of their little jokes.

"I suppose if you're already overwrought and eager to quit, and you've been badly scared by the size of an alien ship, it's pretty understandable that the sight of human bodies, along with the story that they're just a convenient food supply, might seem pretty convincing. But I was already pretty dubious about the genuineness of our pals, and when I saw those bodies it was pretty plain that we were hot on the trail of Omega Colony. There was no other place humans could have come from out there. We had to find out the location from the Mancji."

"But, Admiral," said the reporter, "true enough they were humans, and presumably had some connection with the colony, but they were naked corpses stacked like cordwood. The Mancji had stated that these were slaves, or rather domesticated animals; they wouldn't have done you any good."

"Well, you see, I didn't believe that," the Admiral said. "Because it was an obvious lie. I tried to show some of the officers, but I'm afraid they weren't being too rational just then.

"I went into the locker and examined those bodies; if Kramer had looked closely, he would have seen what I did. These were no tame animals. They were civilized men."

"How could you be sure, Admiral? They had no clothing, no identifying marks, nothing. Why didn't you believe they were cattle?"

"Because," said the Admiral, "all the men had nice neat haircuts." **THE END**

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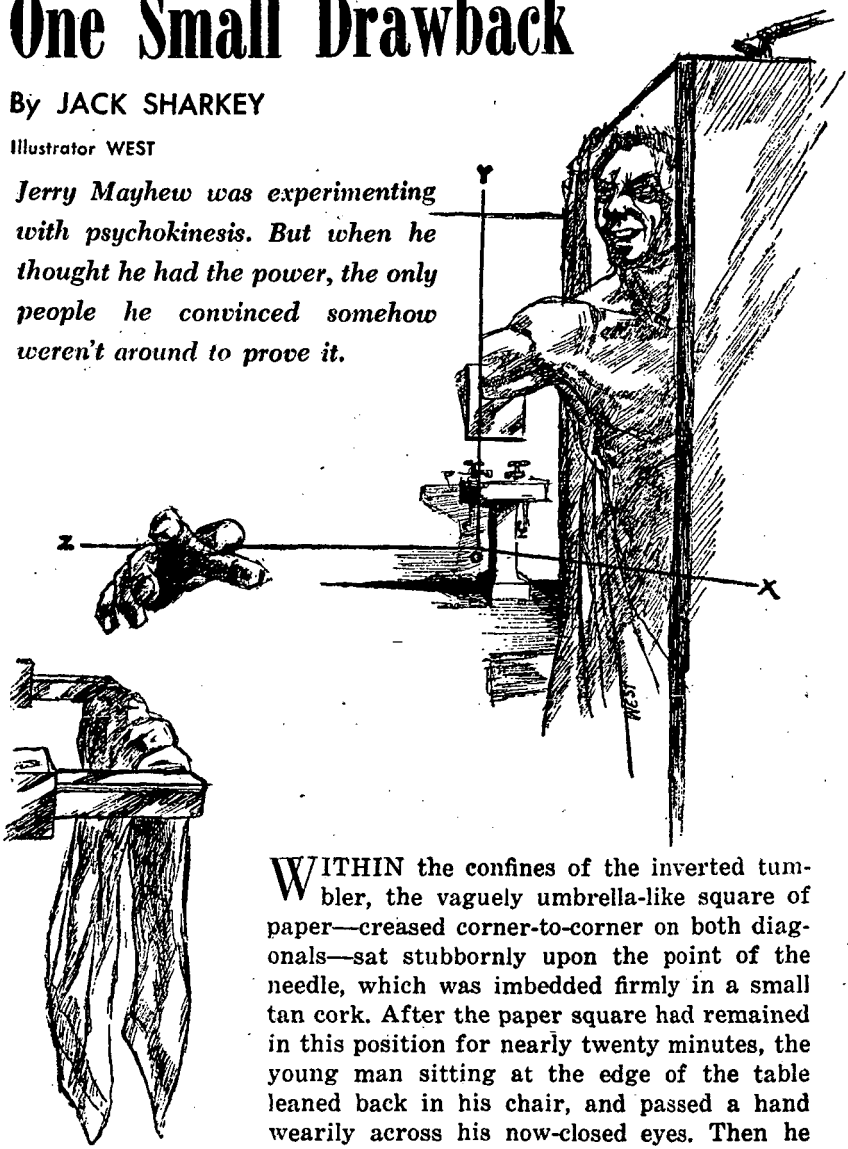
One Small Drawback

By JACK SHARKEY

Illustrator WEST

Jerry Mayhew was experimenting with psychokinesis. But when he thought he had the power, the only people he convinced somehow weren't around to prove it.



WITHIN the confines of the inverted tumbler, the vaguely umbrella-like square of paper—creased corner-to-corner on both diagonals—sat stubbornly upon the point of the needle, which was imbedded firmly in a small tan cork. After the paper square had remained in this position for nearly twenty minutes, the young man sitting at the edge of the table leaned back in his chair, and passed a hand wearily across his now-closed eyes. Then he peeked across his knuckles at his companion.

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"Well," grinned Jerry Mayhew, "that seems to be that."

"You haven't been at it even half an hour," his vis-a-vis observed with a smile in which the frank humor softened the mockery. "Most people give it at least an hour."

"With what result?" asked Jerry, with open sarcasm.

The other man laughed. "Much the same, I'm afraid. After all —" He lifted the tumbler, and the motion set to stirring an eddy of air that sufficed to twirl the delicately balanced paper square. "—it's still only a theory. For all we so-called psychic 'experts' know, this approach to the problem only makes things tougher. Perhaps the ideal beginning for a novice should be with a brick; a cornerstone, even."

The young man raised another tumbler to his lips, and took a long pull at the iced liquid therein, his eyes distant and thoughtful. Then he set it down upon the table once more, and said, "Tell me honestly, doctor; do *you* think psychokinesis is possible?"

The man addressed—Dr. Edmund Baird, of the Norval University Research Board—tilted head and shoulders forward just slightly enough to imply a shrug and the smallest of nods. "I *like* to think it is. Let me put it that way. Oh, I know it hasn't so far been demonstrable, but neither has the theory that a man will die on the face of the sun."

"*Theory!?*" Jerry scoffed.

Baird raised thin grey eyebrows. "That's all it is, you know, until the day some poor astronaut *does* die on the face of the sun. But that's what I mean: Because a thing is not demonstrable, it does not therefore disprove the thing as possible, not by a long shot."

"And you believe that if I sat and stared at that square of paper hard enough, and long enough, I could eventually make it twirl with mind-power alone? And then move on to self-teleportation and continent-lifting?"

"The staring is not necessary, so far as I know, save for its being simply an aid to concentration. And then again—" A rueful quirk twisted the side of his mouth. "—perhaps the concentration is wrong, too. For all I know, the easiest way to influence an object physically with one's mind is to do it by reflex, as it were. A half-hearted, half-thought-out, half-projected thought might shatter a concrete pillbox, so long as the thinker actually believed he could do it."

"Oooh," Jerry groaned, shutting his eyes, "please don't start that again! We only start talking in circles!"

"It's a circular problem," said

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Baird. "To do it, one must believe he can; to believe he can, one must know it is possible; to know that, one must have been able to do it. I didn't promise you it would be easy, Jerry."

"You didn't promise it would be possible, either."

Baird laughed again. "I can hardly promise that, since I still don't know, myself. But I *did* promise my wife I'd be home by midnight, and it's ten to now."

BAIRD rose from his chair, waving off Jerry's automatic offer of assistance, and with his cane made a three-legged movement to the door. Jerry was there before him, and helped him on with his hat and topcoat.

"Thank you for an attentive, comfortable evening," Baird said at the door. "I wish I were as comfortable lecturing in the classroom— And that you were half so attentive."

"Your own theoretical talks are a lot more interesting than the psychology course, I'm afraid, sir."

Baird tendered the younger man a wink. "I feel the same way," he said, then went out into the night. At the end of the walk, guiding his faltering steps with the light that spilled from the still-open door, he turned and said, "You know, Jerry . . . Hypnosis might help— In conditioning the mind, I mean. Remind me, next time I stop over, to have a whack at the problem from your *sub*conscious."

Jerry promised he would, then returned to the dining room of the fraternity house for the empty glasses. As he carried them out to the kitchen for the freshman "pledge" to wash in the morning, his young face was creased with thought.

Leaving the glassware carelessly on the drainboard of the sink, he climbed the stairs to the room he shared with Brad Melik, another senior at Norval. Inside the room, he found Brad snoring lightly in the lower bunk bed. Brad's radio was playing some soft FM pop tunes in the darkened corner by the window, and Jerry crossed the floor and snapped the switch off, gently.

The ensuing quiet, punctuated contrapuntally by a mild muffled snoring from his roommate's bunk, felt like warm velvet pressing in upon his ears. Jerry glanced at his watch, noted the near approach of midnight, then set his gaze upon a pen-and-ink class schedule taped on the wall above his desk. The following day was Friday. He had no morning classes.

"Good," said Jerry, aloud. He slid into the armchair beside his desk, adjusted the gooseneck lamp to angle its light down over his shoulder, then ripped open a fresh pack of cigarettes and lit

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one. After a few thoughtful puffs, he stretched out a long arm to the bookshelf on the wall, snagged the upper rim of a thick volume, and tugged it tilting out into his hand. Scanning the index rapidly, he found the pages he sought, and slumped down further on the end of his spine and started reading.

His cigarette was lying dead in the ashtray, two-thirds of its length undisturbed cylindrical white ash, when he closed the book and scowled.

"I wonder if I could," he mused, in a half-sounded whisper. According to the book, auto-hypnosis was even simpler than getting suggestion from outside sources, if one just knew how to achieve it. The trick was to let the mind relax, to let awareness of surroundings fade away, to cut off all sensory sensation, be it sound, the feel of the chair beneath his body, or the appearance of the room. Then, when the mind was sufficiently dissociated from the body, the *will* took over, and simply gave the body its orders. If the book were correct, the orders would be obeyed.

"But will my *mind* take orders from my *mind?*" Jerry asked himself. The book hadn't quite covered that part of auto-hypnosis to his satisfaction. There was mention made of things like achieving mental tranquillity, or of teaching oneself to awaken at a given hour without benefit of alarm clock, or how to increase one's power of memory. Not, however, a damned thing about the release of a man's psychokinetic powers. If any.

"At least," he thought, wearily, "I have nothing to lose. The worst that can happen is I'll fall asleep in the chair." He lifted the volume once more, and checked to reassure himself that a person simply left in hypnotic "sleep" would drift soon into normal sleep, and awaken "unusually refreshed".

"What the hell," said Jerry. "I can't go wrong."

That decided, he set to work trying self-hypnosis.

THE sense of sight was easily submerged by closing his eyes. Sound was a bit harder, but then Brad twisted around in bed and ceased snoring, and there was nothing more for Jerry to hear but the enveloping silence of the night. And, he found, by lying relaxed and letting himself just *sag*, his bodily sensations grew tenuous and began to ebb away. Final departure of all sensory experience was reached by beginning his strong-willed concentration on his subconscious mind, and thus distracting himself from any sensory messages he might otherwise have received. He pushed his mind toward Knowledge.

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He was floating. He, Jerry, himself, the ego that was Jerry Mayhew hovered isolated in an inky void. He let his thoughts lie calm and dormant for many minutes, then let the tiniest particle of concentration formulate the inner-eye image of a door. The door hung against the void, guarding the pathway to the knowledge he sought. Slowly, carefully, his will reached out and tried to move the door ajar. It remained steady, its position as firmly fixed as though its edges had been fused with cement. Again he tried, and again the door remained shut.

Carefully, Jerry made his will relax its efforts. It was obvious that force of thought was not the answer. He let his will float idly before that singular door in the empty darkness, while he reasoned out the problem. It would seem that the secrets lying in wait beyond the door were not to be pried from their refuge. But —a spark flared in his mind, exciting his consciousness— But if the knowledge could not be taken *out* . . . Could his mind, perhaps, simply enter *in?*

Again his mind approached the door, the door which gave familiar form to the barrier-ness that it actually was. This time he did not try to move the door ajar. Instead, he let his mind lean upon it, let his inner self gently press its psychic inertia upon the portal, concentrating on the thought of—not moving it—but on the thought of simply *passing* it . . .

And then he was within. And he suddenly Knew.

JERRY blinked his eyes against the warm yellow light, then squinted through them, and finally opened them wide. His back, the lower part of his spine barely still upon the forward edge of the chair, felt as though it were encased in plaster, and his head throbbed dully near the base of his skull where it had propped itself against the upper surface of the chair-back. With an effort, and a few soft curses, he managed to get to his feet, where he arched his back toward normal concavity, and stretched some of the tension from his shoulders.

It was morning, and he'd slept in the chair all the night long. On the floor, the fallen volume caught his eye. He grunted and aimed a kick at it, then reconsidered and simply replaced it upon the bookshelf.

"*That* was a waste," he decided, rubbing the short bristles on his jaw. As always, when he slept in his clothes, he was damp with perspiration. Yawning lustily, and rolling his head on his neck to take out the lingering kinks, he stripped, wrapped a towel about his waist, and—after

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grabbing his soap and shaving gear from his locker, stepped into his Japanese-style shower sandals and padded down the hall toward the frat-house washroom, already crowded.

The shower-spray was hard, hot and stimulating upon his skin, and he turned himself vertically upon an imaginary spit, savoring the blood-stirring tingle of the hissing water. A thin cascade of soap film from his scrubbed forehead slithered down maliciously into his eyes, and stung them unmercifully.

"*Yo!*" he hollered, waggling a bare arm out of the shower stall toward whoever might still be performing his morning ablutions at the sink. "Gimme th' tow'l, damn it!"

His fingers closed over the thick absorbent pile of the towel, and he muttered his thanks as he sopped the painful suds from his eyes. He blinked them open experimentally, gave a final dab to one inner corner, and said, "Damn near burned my—" He stopped, then, because there was nobody to talk to. He looked at the double-hinged door to the corridor, but it wasn't even swinging. Puzzled, still wiping mechanically at his face with the towel, he squelched in his wet sandals across the tiles to the door and looked outside. At the very end of the hall, Brad was just coming out of their room, unshaven and unshowered, heading toward him.

"You could have *called* me—" Brad complained, as he squeezed past Jerry in the doorway. "*I* have classes this morning, if you don't . . . Oh, say, can I borrow your soap? Forgot mine."

Jerry bemusedly handed the bar over to his roommate, then slowly made his way back toward their room. He knew, as surely as he knew that one of the other men might have given him the towel on his way out of the washroom, that no one had done that at all.

The hair prickled slightly on the nape of his neck as he considered the alternative to human agency giving him that towel. The towel-rack was five feet from the mouth of the stall, a tough stretch for one arm, even if he'd leaned out of the stall. And he hadn't. He'd hollered for a towel, reached—And had gotten a towel.

Still enfolded in that towel, he stood in the center of his room, thinking back to his mental exertions of the previous night. Beyond his final success in penetrating that imaginary doorway, his memory failed him. He'd gone in, and then . . . He'd Known . . .

"Known *what*, though?" he muttered. "What did I find out in there, anyhow?"

He scrubbed at his drooling

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hair with the towel, then flung it aside on the bed and commenced dressing. Dr. Baird had a free period coming up in half an hour, and Jerry had a lot he wanted to find out.

AND you're positive that none of your fraternity brothers could have handed you the towel just as he was leaving the room?" asked Baird, his eyes bright and glittery behind his thin spectacles.

Jerry shook his head. "No, sir. Not *that* positive, if you know what I mean. It's just that whoever gave it to me would've had to move like a lightning bolt to get back into his room without my seeing him. Or at least hearing him moving away from the washroom."

Save for themselves, the faculty lounge was empty, though clouded blue with cigarette smoke near the ceiling. Baird leaned back in a leatherette armchair, tapping the tips of his stubby fingers together, thinking.

"Think you could do it again?" he asked, abruptly.

"That's just it, sir," Jerry sighed, nudging his fist into his opened palm, and grinding angrily with the middle knuckle. "I *did* try 'again', after I got back to my room. Felt like an ass, asking Brad's soap to jump into the dish. Especially when it didn't. And my shoes and socks got onto my feet the usual way, too."

"Maybe," Baird observed dryly, "it won't work unless you have soap in your eyes."

"Aw, come on, sir—!"

Baird grinned. "Seriously, though, it might have been the fact that your eyes were shut, and thereby *unable* to tell your brain that you *couldn't* get that towel. It gave you the necessary factor of *belief*."

The sudden jangle of a bell in the corridor was followed by the slamming-open of many doors, and the heavy pounding of hurrying feet. Baird grunted gloomily, then got up slowly from his chair, his hand gripping the cane tightly.

"Sorry, son. I have to get to class, now. But I am interested; very interested. I wish we could talk more of this right now, while it's still fresh in your mind, and unembroidered by fancy, but— Can you meet me in the psychology lab tonight, say about seven?"

"Well, I—I *have* a date, sir, but— Ah, hell, she's not that important. I can break it."

"Good," nodded Baird. "Excellent. I'll see you then, Jerry."

After the door had closed behind the older man, Jerry recalled that students were not permitted in the lounge unless actually consulting a teacher, so he went to the door, one hand fum-

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bling at the breast pocket of his sportshirt for a cigarette. Only then did he remember that he had—in his eagerness to see Baird—left them back in his room on the desk.

"Holy hell!" he choked, shaken.

Because his fingers, uninformed by his briefly forgetful mind that they could not find the cigarettes in his pocket, had gone ahead and found them there. He stood frozen in the doorway for one short second, then he was springing after Baird down the length of the hall.

He nearly knocked the older man down in his haste, and when he'd blurted out this second occurrence—to the intrigued glances of passing students, who caught his monumental excitement if not his exact words—Jerry was surprised to see, not delight, but sharp suspicion in Baird's bright grey eyes.

"Sir, you— You *believe* me, don't you?" he faltered.

"Yes . . ." said Baird, his voice at once commiserating and clinically aloof. "That is to say, I believe that *you* believe you." Pausing just long enough to let the unnerving implication of this statement register on the young man, he added, "I think my class can wait, after all, Jerry." A pale smile tweaked the corners of his mouth. "I doubt if there will be many tears shed at my unaccustomed absence. Coffee at the Union Building is—as I recall my own undergraduate days—much more fun than fifty-five minutes of note-taking. Come with me."

"But sir— You don't think I'm . . ."

"Nuts? Well, perhaps, but don't let it worry you. Every man, in his own way, is slightly screwy. Now come along. Madge will be doing the shopping about now, and we'll have my house to ourselves for a few hours."

"But your classes, sir—"

"Only important because one goes there to acquire knowledge. I consider my own acquisition of knowledge as vital a matter as my students'. They want to learn from me; I want to learn from you. Not another word, now, Jerry. Come along."

AFTER filling Dr. Baird in on even the most trivial details concerning the two separate occurrences, Jerry added, uneasily, "But if you believe the possibility of psychokinesis, sir, why are you going to such great lengths to doubt what seem to be two demonstrations?"

"I was thinking only of your mind, son," said Baird, not unkindly. "I don't mean, at all, the fact that you might be self-deluded. I mean the fact that if these things *do* happen, but happen only when no one else is there to observe them, *you* might

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begin to suspect your sanity. Auto-hypnosis is no toy. Last night, you meddled with a power that even experts approach on tiptoe, as it were. You see, Jerry, if there *isn't* a hidden power in your mind, and you have hypnotically commanded yourself to *find* this power—Well, your subconscious might well be forced to *invent* these so-called 'occurences'."

"You mean that, if I find I can do all sorts of things to objects—influence them physically with my mind—I won't be able to tell if I'm doing the things for real, or simply imagining they are occurring . . . Is that it, sir?"

Baird nodded solemnly. "And that is why I am so deeply concerned. If your manifestations are true, or if they are false, your mind will have no way of knowing. It will not be able to trust what it perceives through the medium of your senses. And, conceivably, the state may be reached in which if *nothing* untoward occurs, you will begin to doubt *that*."

"How so, sir?" asked Jerry, both fascinated and repelled by the statement.

"If you reach for an apple, say, and pick it up in your hand, you might wonder if you actually *have* used your hand, or if your subconscious—sensing that you dread believing in your new-found power—has merely deluded you into *thinking* you are lifting the apple manually, when actually it has flown from the fruit-bowl right to your lips. Do you see?"

Jerry nodded, grimly. "It means that I could start driving myself nuts *whatever* happens. Like I bought me a one-way ticket to the funny-farm."

"Exactly," said Baird. "Which is why it is now imperative that you demonstrate this power of yours for an *outside* viewer. Myself. If *I* witness the occurrence, then we'll know you're all right. But if you alone see the thing happen, I can tell you so, and we'll know what to do for you."

"We will?" said Jerry, who'd begun to feel cold and afraid until the older man's final statement.

"Why, certainly. Nothing simpler. If it turns out that you are simply self-deluded, then *I* will hypnotize you, and remove the suggestion you gave your brain last night. But if the power *does* function—" A devilish grin creased Baird's friendly face. "—then it's heigh-ho for *Life* Magazine's cover, the Nobel Prize, and our accepting payola from the Federal Government for the favor of not teleporting the ingots out of Fort Knox!"

Jerry, taken unawares by the man's sudden surge of youthful glee, burst into laughter. It felt good to laugh.

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"Now, now," said Baird, composing himself. "No celebrating yet. First we'll have to see a demonstration."

"But how can we—?" Jerry began.

"Ssh!" Baird flailed an agitated hand at Jerry. "I'm thinking . . . Let me see, now. It seems that both these events occurred when you were completely unaware that they could *not* occur, correct?"

Jerry nodded, his eyes bright with suppressed excitement.

". . . Ah!" Baird snapped his fingers sharply. "I have it! Close your eyes . . . There, that's it. Now, I'll just—uh—reach over here on the table and pick up a magazine . . . Now here is my — Keep the eyes *shut*— Here is my idea. I am going to hand you this magazine, Jerry. Or perhaps I am *not*. Do you follow me?"

Jerry, leaning back in the chair with his eyes tightly shut, grinned and nodded. "All I have to do is reach out for it, right? And, one way or the other, I *should* get it."

"Exactly. Now reach for it."

THE young man's hand stretched forward, fingers wide and ready, in the direction of the teacher's voice. In a second, he felt the brush of cool glossy paper against his fingertips, and gripped tightly. He opened his eyes.

The old man was gone and Jerry's eyes came to horrified focus on the stout wooden cane, still leaning against the arm of the chair. To Jerry's mind returned the words of Dr. Baird, with chill realization. . . .

"The fact . . ." the old man had said, "that these things happen only when no one else is there to observe them . . ."

It was not a corollary of the power; it was the result.

* * *

Two students were found missing, later on. One whose shower-clogs and towel were found lying in the fraternity house washroom where he'd last been seen, and the other—Brad Melik—who had vanished from his room where he'd gone to get a forgotten textbook at the moment Jerry had been reaching into his sport-shirt pocket for cigarettes that lay on the desk in his room.

When the terrible import of these disappearances came home to Jerry, he had "a complete nervous breakdown", and was sent to a sanitarium to recuperate.

A week later, when the physician drove out to check on his patient, he found his room empty, and his belongings missing, too. Jerry had wandered off from the "funny-farm".

The guards hadn't tried to stop him.

There weren't any guards. Not any more. **THE END**

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POSTMARK GANYMEDE

By
ROBERT
SILVERBERG

Consider the poor mailman of the future. To "sleet and snow and dead of night"—things that must not keep him from his appointed rounds—will be added, sub-zero void, meteors, and planets that won't stay put. Maybe he'll decide that for six cents an ounce it just ain't worth it.

I'M washed up," Preston growled bitterly. "They made a postman out of me. Me—a postman!"

He crumpled the assignment memo into a small, hard ball and hurled it at the bristly image of himself in the bar mirror. He hadn't shaved in three days—which was how long it had been since he had been notified of his removal from Space Patrol Service and his transfer to Postal Delivery.

Suddenly, Preston felt a hand on his shoulder. He looked up and saw a man in the trim gray of a Patrolman's uniform.

"What do you want, Dawes?"

"Chief's been looking for you, Preston. It's time for you to get going on your run."

Preston scowled. "Time to go deliver the mail, eh?" He spat. "Don't they have anything better to do with good spacemen than make letter carriers out of them?"

The other man shook his head. "You won't get anywhere grousing about it, Preston. Your papers don't specify which branch you're assigned to, and if they want to make you carry the mail—that's it." His voice became suddenly gentle. "Come on, Pres. One last drink, and then let's go. You don't want to spoil a good record, do you?"

"No," Preston said reflectively. He gulped his drink and stood up. "Okay. I'm ready. Neither snow nor rain shall stay me from my ap-

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pointed rounds, or however the damned thing goes."

"That's a smart attitude, Preston. Come on—I'll walk you over to Administration."

Savagely, Preston ripped away the hand that the other had put around his shoulders. "I can get there myself At least give me credit for that!"

"Okay," Dawes said, shrugging. "Well — good luck, Preston."

"Yeah. Thanks! Thanks real lots."

He pushed his way past the man in Space Grays and shouldered past a couple of barflies as he left. He pushed open the door of the bar and stood outside for a moment.

It was near midnight, and the sky over Nome Spaceport was bright with stars. Preston's trained eye picked out Mars, Jupiter, Uranus. There they were—waiting. But he would spend the rest of his days ferrying letters on the Ganymede run.

He sucked in the cold night air of summertime Alaska and squared his shoulders.

Two hours later, Preston sat at the controls of a one-man patrol ship just as he had in the old days. Only the control panel was bare where the firing studs for the heavy guns was found in regular patrol ships. And in the cargo hold instead of crates of spare ammo there were three bulging sacks of mail destined for the colony on Ganymede.

Slight difference, Preston thought, as he set up his blasting pattern.

"Okay, Preston" came the voice from the tower. "You've got clearance."

"Cheers," Preston said, and yanked the blast-lever. The ship jolted upward, and for a second he felt a little of the old thrill—until he remembered.

He took the ship out in space, saw the blackness in the viewplate. The radio crackled.

"Come in, Postal Ship. Come in, Postal Ship."

"I'm in. What do you want?"

"We're your convoy," a hard voice said. "Patrol Ship 08756, Lieutenant Mellors, above you. Down at three o'clock, Patrol Ship 10732, Lieutenant Gunderson. We'll take you through the Pirate Belt."

Preston felt his face go hot with shame. Mellors! Gunderson! They would stick two of his old sidekicks on the job of guarding him.

"Please acknowledge," Mellors said.

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"The iceworms were not expecting any mail—just the mailman."

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Preston paused. Then: "Postal Ship 1872, Lieutenant Preston aboard. I acknowledge message."

There was a stunned silence. "*Preston?* Hal Preston?"

"The one and only," Preston said.

"What are you doing on a Postal ship?" Mellors asked.

"Why don't you ask the Chief that? He's the one who yanked me out of the Patrol and put me here."

"Can you beat that?" Gunderson asked incredulously. "Hal Preston, on a Postal ship."

"Yaeh. Incredible, isn't it?" Preston asked bitterly. "You can't believe your ears. Well, you better believe it, because here I am."

"Must be some clerical error," Gunderson said.

"Let's change the subject," Preston snapped.

They were silent for a few moments, as the three ships —two armed, one loaded with mail for Ganymede—streaked outward away from Earth. Manipulating his controls with the ease of long experience, Preston guided the ship smoothly toward the gleaming bulk of far-off Jupiter. Even at this distance, he could see five or six bright pips surrounding the huge planet. There was Callisto, and—ah—there was Ganymede.

He made computations, checked his controls, figured orbits. Anything to keep from having to talk to his two ex-Patrolmates or from having to think about the humiliating job he was on. Anything to—

"Pirates! Moving up at two o'clock!"

Preston came awake. He picked off the location of the pirate ships—there were two of them, coming up out of the asteroid belt. Small, deadly, compact, they orbited toward him.

He pounded the instrument panel in impotent rage, looking for the guns that weren't there.

"Don't worry, Pres," came Mellors' voice. "We'll take care of them for you."

"Thanks," Preston said bitterly. He watched as the pirate ships approached, longing to trade places with the men in the Patrol ships above and below him.

Suddenly a bright spear of flame lashed out across space and the hull of Gunderson's ship glowed cherry red. "I'm oaky," Gunderson reported immediately. "Screens took the charge."

Preston gripped his con-

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trols and threw the ship into a plunging dive that dropped it back behind the protection of both Patrol ships. He saw Gunderson and Mellors converge on one of the pirates. Two blue beams licked out, and the pirate ship exploded.

But then the second pirate swooped down in an unexpected dive. "Look out!" Preston yelled helplessly—but it was too late. Beams ripped into the hull of Melors' ship, and a dark fissure line opened down the side of the ship. Preston smashed his hand against the control panel. Better to die in an honest dogfight than to live this way!

It was one against one, now—Gunderson against the pirate. Preston dropped back again to take advantage of the Patrol ship's protection.

"I'm going to try a diversionary tactic," Gunderson said on untappable tight-beam. "Get ready to cut under and streak for Ganymede with all you got."

"Check."

Preston watched as the tactic got under way. Gunderson's ship traveled in a long, looping spiral that drew the pirate into the upper quadrant of space. His path free, Preston guided his ship under the other two and toward unobstructed freedom. As he looked back, he saw Gunderson steaming for the pirate on a sure collision orbit.

He turned away. The score was two Patrolmen dead, two ships wrecked—but the mails would get through.

Shaking his head, Preston leaned forward over his control board and headed on toward Ganymede.

The blue-white, frozen moon hung beneath him. Preston snapped on the radio.

"Ganymede Colony? Come in, please. This is your Postal Ship." The words tasted sour in his mouth.

There was silence for a second. "Come in, Ganymede," Preston repeated impatiently — and then the sound of a distress signal cut across his audio pickup.

It was coming on wide beam from the satellite below —and they had cut out all receiving facilities in an attempt to step up their transmitter. Preston reached for the wide-beam stud, pressed it.

"Okay, I pick up your signal, Ganymede. Come in, now!"

"This is Ganymede," a tense voice said. "We've got trouble down here. Who are you?"

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"Mail ship," Preston said. "From Earth. What's going on?"

There was the sound of voices whispering somewhere near the microphone. Finally: "Hello, Mail Ship?"

"Yeah?"

"You're going to have to turn back to Earth, fellow. You can't land here. It's rough on us, missing a mail trip, but—"

Preston said impatiently, "Why can't I land? What the devil's going on down there?"

"We've been invaded," the tired voice said. "The colony's been completely surrounded by iceworms."

"Iceworms?"

"The local native life," the colonist explained. "They're about thirty feet long, a foot wide, and mostly mouth. There's a ring of them about a hundred yards wide surrounding the Dome. They can't get in and we can't get out—and we can't figure out any possible approach for you."

"Pretty," Preston said. "But why didn't the things bother you while you were building your Dome?"

"Apparently they have a very long hibernation-cycle. We've only been here two years, you know. The iceworms must all have been asleep when we came. But they came swarming out of the ice by the hundreds last month."

"How come Earth doesn't know?"

"The antenna for our long-range transmitter was outside the Dome. One of the worms came by and chewed the antenna right off. All we've got left is this short-range thing we're using and it's no good more than ten thousand miles from here. You're the first one who's been this close since it happened."

"I get it." Preston closed his eyes for a second, trying to think things out.

The Colony was under blockade by hostile alien life, thereby making it impossible for him to deliver the mail. Okay. If he'd been a regular member of the Postal Service, he'd have given it up as a bad job and gone back to Earth to report the difficulty.

But I'm not going back. I'll be the best damned mailman they've got.

"Give me a landing orbit anyway, Ganymede."

"But you can't come down! How will you leave your ship?"

"Don't worry about that," Preston said calmly.

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"We have to worry! We don't dare open the Dome, with those creatures outside. You *can't* come down, Postal Ship."

"You want your mail or don't you?"

The colonist paused. "Well—"

"Okay, then," Preston said. "Shut up and give me landing coordinates!"

There was a pause, and then the figures started coming over. Preston jotted them down on a scratch-pad.

"Okay, I've got them. Now sit tight and wait." He glanced contemptuously at the three mail-pouches behind him, grinned, and started setting up the orbit.

Mailman, am I? I'll show them!

He brought the Postal Ship down with all the skill of his years in the Patrol, spiralling in around the big satellite of Jupiter as cautiously and as precisely as if he were zeroing in on a pirate lair in the asteroid belt. In its own way, this was as dangerous, perhaps even more so.

Preston guided the ship into an ever-narrowing orbit, which he stabilized about a hundred miles over the surface of Ganymede. As his ship swung around the moon's poles in its tight orbit, he began to figure some fuel computations.

His scratch-pad began to fill with notations.

Fuel storage—
Escape velocity—
Margin of error—
Safety factor—

Finally he looked up. He had computed exactly how much spare fuel he had, how much he could afford to waste. It was a small figure—too small, perhaps.

He turned to the radio. "Ganymede?"

"Where are you, Postal Ship?"

"I'm in a tight orbit about a hundred miles up," Preston said. "Give me the figures on the circumference of your Dome, Ganymede?"

"Seven miles," the colonist said. "What are you planning to do?"

Preston didn't answer. He broke contact and scribbled some more figures. Seven miles of iceworms, eh? That was too much to handle. He had planned on dropping flaming fuel on them and burning them out, but he couldn't do it that way.

He'd have to try a different tactic.

Down below, he could see the blue-white ammonia ice that was the frozen atmos-

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phere of Ganymede. Shimmering gently amid the whiteness was the transparent yellow of the Dome beneath whose curved walls lived the Ganymede Colony. Even forewarned, Preston shuddered. Surrounding the Dome was a living, writhing belt of giant worms.

"Lovely," he said. "Just lovely."

Getting up, he clambered over the mail sacks and headed toward the rear of the ship, hunting for the auxiliary fuel tanks.

Working rapidly, he lugged one out and strapped it into an empty gun turret, making sure he could get it loose again when he'd need it.

He wiped away sweat and checked the angle at which the fuel-tank would face the ground when he came down for a landing. Satisfied, he knocked a hole in the side of the fuel-tank.

"Okay, Ganymede," he radioed. "I'm coming down."

He blasted loose from the tight orbit and rocked the ship down on manual. The forbidding surface of Ganymede grew closer and closer. Now he could see the ice-worms plainly.

Hideous, thick creatures, lying coiled in masses around the Dome. Preston checked his spacesuit, making sure it was sealed. The instruments told him he was a bare ten miles above Ganymede now. One more swing around the poles would do it.

He peered out as the Dome came below and once again snapped on the radio.

"I'm going to come down and burn a path through those worms of yours. Watch me carefully, and jump to it when you see me land. I want that airlock open, or else."

"But—"

"No buts!"

He was right overhead now. Just one ordinary-type gun would solve the whole problem, he thought. But Postal Ships didn't get guns. They weren't supposed to need them.

He centered the ship as well as he could on the Dome below and threw it into automatic pilot. Jumping from the control panel, he ran back toward gun turret and slammed shut the plexilite screen. Its outer wall opened and the fuel tank went tumbling outward and down. He returned to his control-panel seat and looked at the viewscreen. He smiled.

The fuel-tank was lying near the Dome—right in the middle of the nest of ice-

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worms. The fuel was leaking from the puncture.

The iceworms writhed in from all sides.

"Now!" Preston said grimly.

The ship roared down, jets blasting. The fire licked out, heated the ground, melted snow—ignited the fuel tank! A gigantic flame blazed up, reflected harshly off the snows of Ganymede.

And the mindless iceworms came, marching toward the fire, being consumed, as still others devoured the bodies of the dead and dying.

Preston looked away and concentrated on the business of finding a place to land the ship.

The holocaust still raged as he leaped down from the catwalk of the ship, clutching one of the heavy mail sacks, and struggled through the melting snows to the airlock.

He grinned. The airlock was open.

Arms grabbed him, pulled him through. Someone opened his helmet.

"Great job, Postman!"

"There are two more mailsacks," Preston said. "Get men out after them."

The man in charge gestured to two young colonists, who donned spacesuits and dashed through the airlock. Preston watched as they raced to the ship, climbed in, and returned a few moments later with the mailsacks.

"You've got it all," Preston said. "I'm checking out. I'll get word to the Patrol to get here and clean up that mess for you."

"How can we thank you?" the official-looking man asked.

"No need to," Preston said casually. "I had to get that mail down here some way, didn't I?"

He turned away, smiling to himself. Maybe the Chief *had* known what he was doing when he took an experienced Patrol man and dumped him into Postal. Delivering the mail to Ganymede had been more hazardous than fighting off half a dozen space pirates. *I guess I was wrong,* Preston thought. *This is no snap job for old men.*

Preoccupied, he started out through the airlock. The man in charge caught his arm. "Say, we don't even know your name! Here you are a hero, and—"

"Hero? Preston shrugged. "All I did was deliver the mail. It's all in a day's work, you know. The mail's got to get through!"

THE END

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FACT

EXTRA-TERRESTRIAL LIFE Part 3

By BEN BOVA

Is life an inevitable feature of the universe?

If we pick out a star at random and assume that it has a planetary system, is it reasonable to conclude that one or more of those planets must bear life?

"Inevitable" is a hard word for scientists to swallow. They are trained to consider nothing as inevitable. Science deals with probabilities; an experiment or theory may approach absolute certainty, but will never reach it. So by "inevitable," on the pages to follow, we mean ninety-nine plus percent certain.

the Inevitability of Life

Illustrated by FINLAY

THE LIVING SOLAR SYSTEM

WE know that life has evolved on Earth. In our July article we saw that the chances for life on Mars are excellent; that Venus is another strong possibility as a harbor for life, and that giant Jupiter might also bear living creatures beneath its swirling clouds. The other giant planets seem less likely to have life, and Mercury, Luna and Pluto are apparently barren, we deduced.

Notice what these speculations force us to conclude: *life is an in-*

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tegral part of the Solar System. In other words, the same forces that fashioned the Sun and planets have also brought about the creation of living things. Until quite recently, there was no evidence whatsoever to either support or destroy this conclusion. But in the past few years a steady flow of authenticated experimental evidence has been accumulating. Together with two powerful theoretical concepts, they have made it seem virtually certain that life is as much a part of the Solar System—and the universe—as are the Sun and stars. It now seems clear that the processes that formed the planets simultaneously prepared the groundwork for the evolution of living creatures.

EVOLUTION OF THE MOLECULES

BEFORE we discuss the experimental evidence for life beyond the Earth, we should examine two comparatively recent concepts from the field of biochemistry: (1) chemical evolution; and (2) autocatalysis.

Chemical evolution: This concept bridges the gap between atoms and life. If we conceive of the simplest form of life as a single nucleoprotein molecule—a combination of a DNA molecule and a protein molecule—we can see that even this primitive "creature" is enormously complicated in comparison to nonliving molecules. DNA itself contains millions of atoms in an intricate structure; how can we explain its creation out of individual atoms of carbon, oxygen, etc.?

The concept of chemical evolution simply implies that there was a period when the simple elements and compounds combined in constantly more complicated ways to form constantly larger, more complex molecules. Eventually—in the course of billions of years—DNA evolved, together with other molecules essential to life such as RNA and the various proteins.

Autocatalysis: Chemical evolution tells us what happened; autocatalysis helps to explain how it happened. Briefly, the theory is that certain chemical substances tend to catalyze (speed up) reactions that lead to the formation of more of themselves. Thus, chemical substance A might be able to react in a number of ways to produce either substance B, C, D, or E. Let us say that E is the best autocatalyst: its very presence near A will "induce" A to manufacture more of E.

Now, E, in turn, may be able to form substances F, G or H. If H is a better autocatalyst than its two competitors, E will turn out mostly H. This mechanism has been verified in chemical laboratories. It helps to

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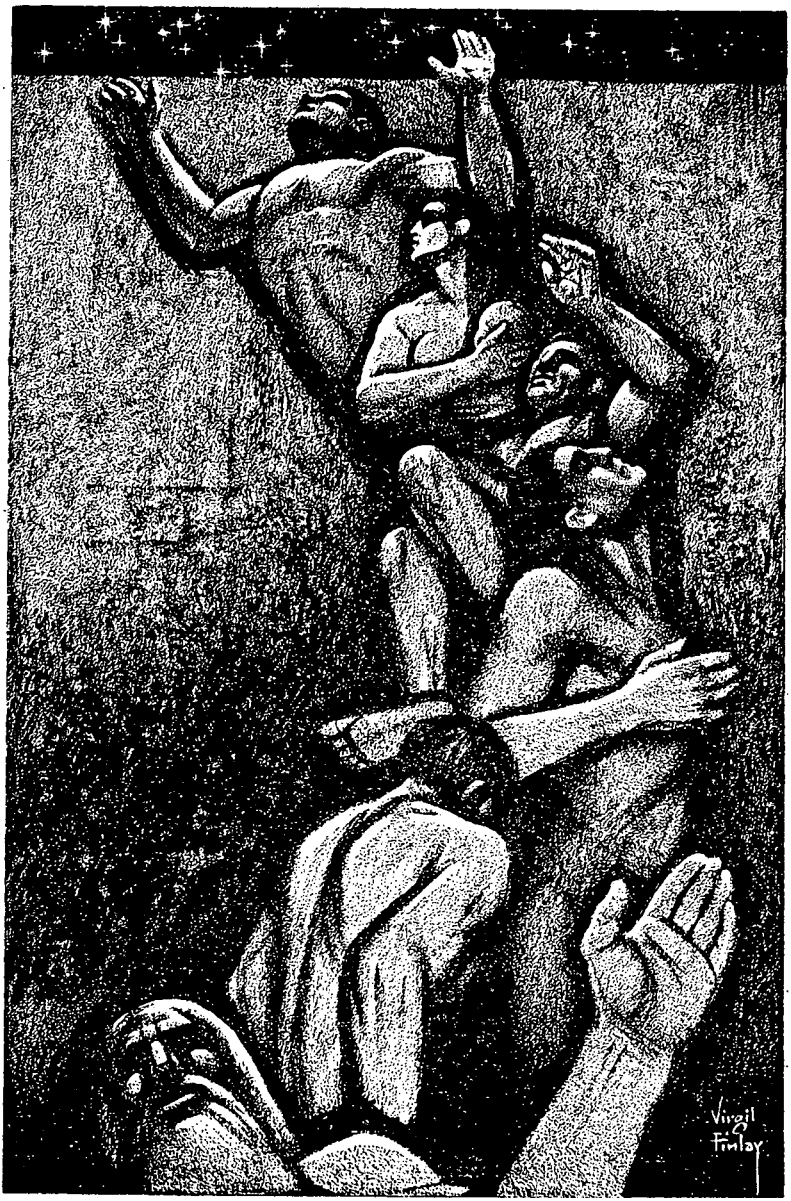

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show how simple chemical compounds "want to" form more complex ones, while at the same time showing that they will not form any compound at random, but will tend to build up only those compounds that are the best autocatalysts. In a chemical sense, this is "survival of the fittest," a natural technique of chemical evolution.

We can see, then, that chemical evolution was not at the mercy of random chance; it followed the rules of natural selection in much the same way that biological evolution obeyed definite laws and followed limited pathways.

EVIDENCE OF LIFE

NOW, with a grasp on our two theoretical concepts, we can examine the experimental evidence for life beyond the Earth.

Item: In 1959, Dr. Melvin Calvin of the University of California announced that he had found in a meteorite minute traces of an organic material that might well be "the precursor of genetic material." Dr. Calvin identified this chemical as being very similar to cytosine, one of the vital building-blocks of DNA. The chemical was found in a meteorite that had fallen in Kentucky in 1950 and had been promptly transferred to the Smithsonian Institution in Washington, D.C. To make certain that the cytosine-like chemical was actually part of the meteorite and not an Earthly contaminant, Dr. Calvin performed similar chemical analyses on other meteorite samples from the Smithsonian. No trace of organic material was found.

Dr. Calvin feels that we have thus obtained a sample of an intermediate step in the long chain of chemical evolution. Within the meteorite, chemical reactions had produced a substance that is but one or two steps away from DNA—the fundamental chemical of life, the "blueprint" chemical that reproduces itself and also builds RNA and the proteins.

Item: In 1952, at the University of Chicago, biochemist Sidney Miller mixed the elements of the Earth's primeval atmosphere (water vapor, ammonia, methane, etc.) and passed an electrical discharge through them. Two simple types of amino acids were obtained. Amino acids are the building blocks of proteins; proteins, in turn, are vital to living creatures. Miller's experiment showed that amino acids (and, presumably, proteins) could arise through autocatalysis in Earth's primeval atmosphere.

Item: Several researchers have succeeded in synthesizing protein from amino acids.

Item: In France in 1960, biochemist J. Oro mixed lethal hy-

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drogen cyanide with an aqueous solution of ammonia. After a few hours at room temperature, the mixture formed a small amount of adenine, another of the structural units of DNA. Autocatalysis again.

Item: In 1961, at Convair Scientific Research Laboratory, Dr. Rainer Berger subjected a mixture of methane, ammonia and water—at minus 300° F—to a beam of protons. Several organic chemicals were formed. Dr. Berger believes that his experiment lends support to the theory that the chemical precursors of life can be formed in space, triggered by the stream of protons flowing from the Sun.

Item: Also in 1961, Dr. Carl Sagan of the University of California conducted an experiment in which he simulated the atmosphere of Jupiter (hydrogen, helium, ammonia, and methane at about minus 200° F) and subjected the gas mixture to ultraviolet light and electrical discharges. Simple organic compounds were formed. Dr. Sagan postulates that an "organic rain" may be falling from Jupiter's atmosphere into a planet-wide ammonia ocean, giving rise to the possibility that living creatures may have evolved there.

Item: The most startling news of all comes from two teams of American researchers. They have found impressive evidence of living cells inside meteorites! This means that not only the "precursor" steps of life have taken place in these meteorites, but that actual living forms have evolved in them.

DR. Frederick D. Sisler and Dr. Walter Newton announced from the National Institute of Health laboratories in Maryland early in 1961 their discovery of bacteria-like "particles" in the Murray meteorite—the same chunk of carbonaceous stone in which Dr. Calvin found the cytosine-like material. The "particles" grew and multiplied when placed in a nutritive salt-water solution, but they did not grow when injected into mice, rats and chickens. Ordinary Earthly bacteria would have thrived in the animals; extra-terrestrial cells would find the environment strange and perhaps even hostile.

A few months after this announcement, Dr. George Claus of New York University Medical Center and Prof. Bartholomew Nagy of Fordham University Department of Chemistry disclosed that they had found fossilized remains of once-living cells in two other carbonaceous meteorites. These cells "resembled, but were not identical to" certain types of earthly algae that live in water. The two mete-

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orites in which they were found fell in Orgueil, France, in 1864, and in Ivuna, Central Africa, in 1889.

As a countercheck against the possibility that the once-living cells were Earth-born and contaminated the meteorites after they fell, the investigators examined several other meteorites of various types. In each type they found a few specimens of earthly contaminants (algae, bacteria, etc.). But only in the Orgueil and Ivuna samples were the "extra-terrestrial" forms found. Claus and Nagy included in their tests a sample of the Murray meteorite; they found "poorly defined particles," which conflicts somewhat with the results of Sisler and Newton's experiments.

Orgueil, Ivuna and Murray are all the type of meteorite called *carbonaceous*—rich in carbon, oxygen, nitrogen, sulphur, and in water that has been chemically linked to minerals in the form of hydrates. Carbonaceous meteorites are rare compared to the other metallic and rocky types. Only 19 carbonaceous samples have been discovered over the whole earth.

It is believed that most meteors are escapees from the planetoid (or asteroid) belt—the swarm of minor planets that orbit, for the most part, between Mars and Jupiter. There is, as yet, no definite theory on how the organic chemicals and cells evolved on these meteorites. Do they represent the first steps of life, taking place on or inside an airless planetoid? Or are they the remains of a higher order of life that once existed on a full-sized planet that was somehow destroyed? No answer.

But, by putting together all the pieces of evidence given above, we can see that there is powerful support for the notion that life can evolve elsewhere than on Earth. The strongest evidence comes from the meteorites, of course, because they are the only representatives of the extra-terrestrial world to visit Earth. Soon, though, rocket technology will reach the point where we can pay visits ourselves. The Moon, Mars and Venus no doubt will have more to tell us than the meteorites.

GAS, DUST, PLANETS AND LIFE

THE problem now is to formulate a single theory that encompasses both the formation of the astronomical bodies of the Solar System—Sun, planets, satellites and all—and the evolution of life on one or more of those bodies. To do this, we must combine the work of the astrophysicists and the biochemists. Obviously, we shall be forced to sketch in only the barest outline of the story. But even a thumbnail

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sketch is better than a blank sheet of paper.

The most widely-accepted theory about the evolution of the Solar System pictures the entire complex of bodies developing from a single vast cloud of cool interstellar gas. According to this theory, which has strong observational evidence supporting it, our Solar System was once—some five to ten billion years ago—a tenuous gas cloud, perhaps several light years in diameter. The gas cloud had a tendency to contract, to fall in on itself under the pressure of its own internal gravitational forces. As it began to shrink, it also began to spin; this is a fundamental characteristic of such clouds. Moreover, the shrinking process accelerated with time, and as the contraction became more pronounced the spinning became constantly faster.

Before long (on an astronomical time scale) the cloud must have become thick enough to form solid particles, consisting of many gas atoms linked together. Astronomers call such particles "interstellar dust." They have photographed many such dust globules in distant nebula today. The supposition is that the globules are proto-stars—clouds of dust that are in the process of forming new stars.

Most of the matter in our cloud sank in to the center of the shrinking, rotating system. But thanks to the innate viscosity of the gas, eddies appeared and developed secondary concentrations of matter. The central concentration eventually became the Sun; the secondary concentrations formed swarms of solid particles that tended to collide with each other, stick together, and slowly aggregate into planetary-sized bodies. We can see on the practically-changeless face of the Moon the results of this primeval traffic pattern.

The original gas cloud was composed almost entirely of hydrogen, with a smattering of helium. There were also traces of heavier elements, among them oxygen, nitrogen and carbon, which had been "manufactured" in older stars and spewed into space when these stars erupted in flares, novae and supernovae.

Slowly, the gathering mass of material in the proto-Sun increased the pressure and temperature at the center of the huge, growing sphere. The weight of some 10^{27} tons of matter caused the whole sphere to begin to glow with the heat generated by gravitational contraction. Finally, the interior of the proto-Sun reached a critical temperature of about 40,000,000°F. The hydrogen atoms began to fuse into helium and liberate a tremendous flow of energy. Sol was a proto-Sun no more. A new star had appeared.

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PRIOR to the "turning on" of the solar power-plant, all of the proto-planets were probably at much the same temperature and had developed in essentially the same way. They all contained small amounts of solid substances, mantled in thick atmospheres of hydrogen. All the planets, Earth included, no doubt resembled the present-day giant Jupiter. But then the Sun became a star. The planets felt a wave of heat sweep across the Solar System. The inner planets—Mercury, Venus, Earth and Mars—found most of their material evaporating off into space, literally boiled away by the Sun's heat.

All that remained of the inner planets were the heavier elements that could stay gravitationally tethered to the planets despite the sudden increase in temperature. Thus the inner planets became small and dense. Even the outer planets—Jupiter, Saturn, Uranus and Neptune—must have been affected somewhat by the Sun's radiation, but thanks to their greater distances, they managed to retain most of their original material, and thus remained giants, vastly unlike their terrestrial cousins. (We do not know how Pluto evolved, simply because we know next to nothing about Pluto. The suspicion is, however, that Pluto was once a satellite of Neptune that escaped and set up its own planetary orbit.)

This description of the evolution of the Solar System is admittedly an over-simplification; it ignores many interesting, perplexing problems that we haven't the space to consider here. We shall concentrate our efforts on trying to understand how the conditions for life may have come about as an integral part of this development of the Solar System.

You recall that the original gas cloud was composed of hydrogen, with traces of oxygen, nitrogen and carbon among other heavier elements. As the cloud condensed and the atoms began to combine into molecules and larger particles of dust, some of their combinations must have resulted in simple molecules that are vital for life—water, carbon dioxide, ammonia.

The first faltering steps of chemical evolution might well have taken place in that swirling cloud of interstellar dust. But what was needed to build really complex molecules was a source of energy. Once the Sun began to shine, the energy source was abundantly available. Chemical evolution, aided by autocatalysis, swung into high gear.

BUT there is a flaw in the picture. For although solar energy will cause simple molecules to build into constantly larger,

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more complicated ones, there comes a point where the whole process breaks down. Molecules of a certain complexity, when they receive more energy, do not increase their size any further but instead tend to break down into simpler substances. Thus it seems that molecules of a moderate complexity can be formed under the stimulus of solar radiation. But these molecules must be shielded from the Sun if they are to build up into the tremendously complicated structures that we know as DNA and proteins.

And there were many places where the moderately-complex molecules could find protection from the Sun—beneath a heavy, cloudy atmosphere (Venus, Jupiter); within porous, water-bearing rocks (the carbonaceous planetoids); in the warm seas of a planet like Earth. We know that on Earth, the molecules continued the process of chemical evolution and eventually developed into living things. Biological evolution began and, once it started, chemical evolution could never appear again: the living molecules immediately seized on the simpler organic compounds as sources of sustaining energy.

The Earth's oceans, which had been an "organic soup" just prior to the development of living forms, were quickly depleted of edible material. Newborn life on Earth faced its first crisis—a food shortage. One type of molecule developed the ability to make its own food from simple chemical compounds by using the energy of sunlight. The chlorophyll trick — photosynthesis — assured life a permanent place on Earth. The next major development was the evolution of cells. Compared to even the highly-complex DNA molecule, a living cell is as complicated as a modern metropolis. But the story from amoeba to man is the province of biological evolution, and need not concern us here.

As we have seen, there is evidence that chemical evolution led to the formation of living cells on other bodies of the Solar System. The necessary conditions almost certainly exist on Mars, Venus and Jupiter. And we have already been visited by extra-terrestrial life forms aboard the carbonaceous meteorites.

It appears sure that life is, indeed, an integral part of the Solar System. But the Sun is only one star out of a hundred billion in the Milky Way. And our galaxy is only one of billions. In our next—and final—article in this series, we will look at the probabilities of planetary systems—and life—circling stars.

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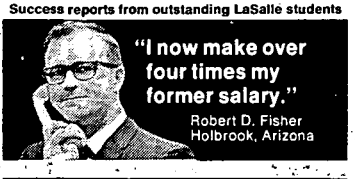

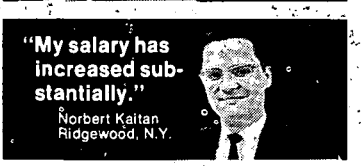

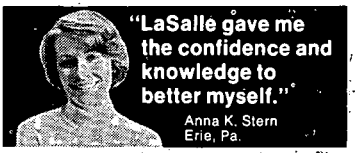

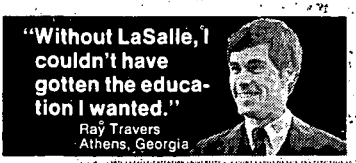

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